Wisconsin DNR 24K Hydrography Version 3
Data Capture and Feature-Coding Decision Rules

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Bureau of Enterprise Information Technology & Applications
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Wisconsin DNR 24K Hydrography
Data Capture and Feature-Coding Decision Rules

Section I
Linear Features (arcs)
- **Linear Type**
- **Quadline**
- **Linear Duration**
- **Flow**
- **Left/Right Bank**
- **Area Boundary Type**

Section II
Polygon Features (polygons)
- **Polygon Type**
- **Duration**

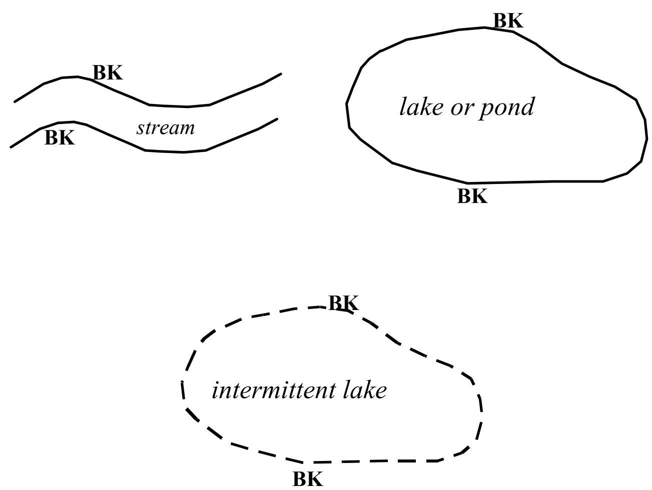
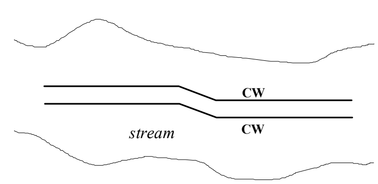
Section III
GNIS Naming Decision Rules
- **River system Names on Linear Features**
- **River System Names on Polygon Features**
- **River system names on Simple Hydro Area (SHAIDs) features**

Section IV
WBIC Decision Rules
- **River system WBICs on Linear Features**
- **River system WBICs on Polygon Features**
- **River system WBICs on Simple Hydro Area(SHAIDs) features**

Section V
Simple Transport Elements (STEMs) and Simple Hydro Area (SHAIDs) Decision Rules

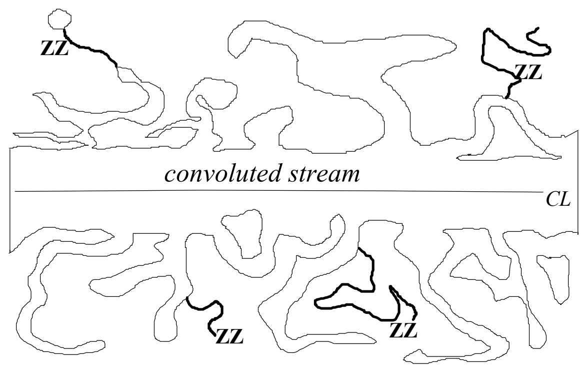
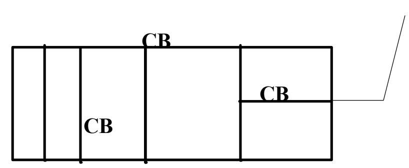
SECTION I
Wisconsin DNR 24K Hydrography
Linear Decision Rules

Wisconsin DNR 24K Hydrography
DECISION RULES

<table>
<tr><th colspan="3">LINEAR TYPE
--VISUALLY DETERMINED—</th></tr>
<tr><th>CODE</th><th>DESCRIPTION INFORMATION</th><th>DATA CAPTURE & CODING METHOD</th></tr>
<tr><td colspan="3">Hydro features (features coded based on USGS quad representations)</td></tr>
<tr><td>BK</td><td>bank or shoreline
Any single, solid or dashed, blue line that outlines a water polygon.
Details about the type of bank are populated in the area_bnd_typ item (that item holds the two codes on either side of the arc).</td><td>Vectorize sufficient points to smoothly define feature while remaining within the raster image outlines.

(Note: See duration for quad line symbol description.)</td></tr>
<tr><td>CW</td><td>channel in water area
A dredged channel in an open water polygon</td><td>Vectorize sufficient points to smoothly define features.
</td></tr>
<tr><td>ZZ</td><td>convoluted stream
Any linear water feature that is part of what has been designated a ‘convoluted stream’ by the editor.
A ‘convoluted stream’ is a series of inter-connected waterways and small water polygons that become so complex that adding DNR features and coding is extremely difficult.</td><td>Vectorize sufficient points to smoothly define features.</td></tr>
</table>

Wisconsin DNR 24K Hydrography
DECISION RULES

LINEAR TYPE
--VISUALLY DETERMINED—

CODE	DESCRIPTION INFORMATION	DATA CAPTURE & CODING METHOD
ZZ cont'd.	• The beginning and ending of a convoluted stream is determined by the creation of closure lines across the stream polygon. • Any linear water feature that is within the same contour of the convoluted stream and may, or may not, be connected to the convoluted stream, is to be included as part of the convoluted stream. • In a situation where two convoluted rivers meet, use the railroad line (if one exists) to delineate which river the convoluted features will be associated with.	
CB	cranberry bog waterway • Water-filled ditches surrounding and within cranberry bogs. • Identified on the quad as a series of parallel and perpendicular blue lines and labeled as a cranberry bog. • If a cranberry bog is shown on a quad as not closed off or as unconnected, we connect them as cranberry bogs, closing off the polygons, and adding labels coded as CB. Reasoning: because the connections do exist, but as culverts and, therefore, don't show up on the quads.	Vectorize sufficient points to capture the feature. 

Wisconsin DNR 24K Hydrography
DECISION RULES

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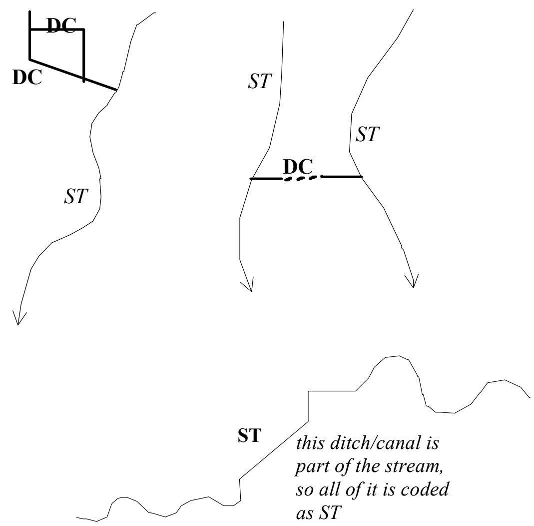
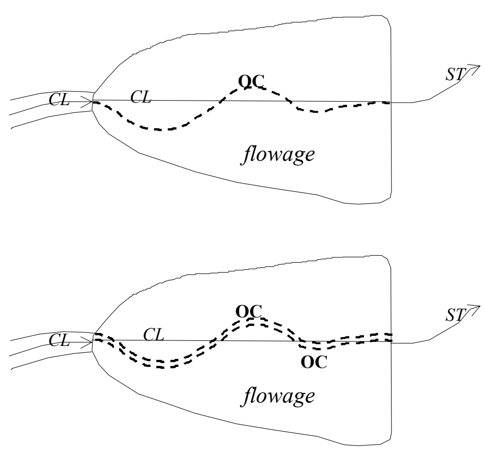
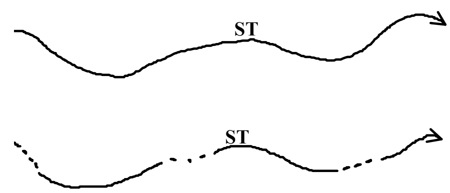
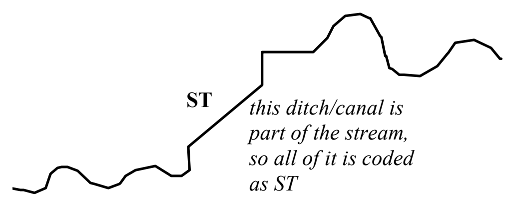
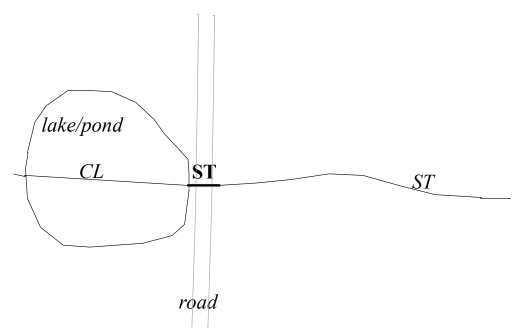
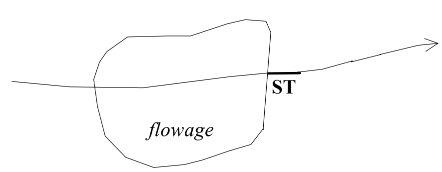
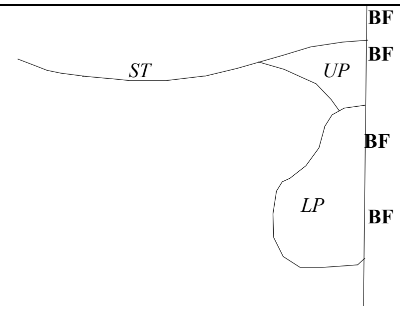
<tr><th>CODE</th><th>DESCRIPTION INFORMATION</th><th>DATA CAPTURE & CODING METHOD</th></tr>
<tr><td>DC</td><td>Single-line ditch or canal
Any single, solid or dashed, blue line labeled as a ditch or canal; OR any single, solid or dashed, blue line that follows man-made linear features or appears too straight to be termed a “natural” stream.
Ditch/canals may be disconnected from the hydro network or be tributary to a stream, but are not internal “channelized” parts of single line streams.</td><td>Vectorize sufficient points to smoothly define feature.

</td></tr>
<tr><td>OC</td><td>original water course
The original course or channel of a river that became submerged when a reservoir or flowage was created.
Appears on the quad as a dashed blue line through a reservoir or flowage.
Any of the OC occurring outside the water polygon will not be captured.
The polygon that is formed from adding the original channel is coded the same as the water polygon it falls within.
The centerline does not run within the OC.</td><td>Vectorize sufficient points to smoothly define feature.

</td></tr>
</table>

Wisconsin DNR 24K Hydrography
DECISION RULES

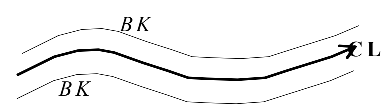
LINEAR TYPE
--VISUALLY DETERMINED—

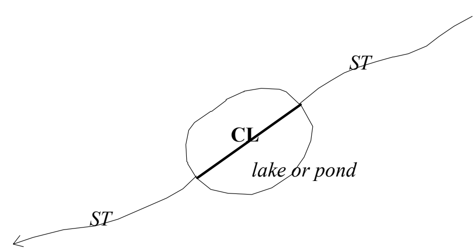
CODE	DESCRIPTION INFORMATION	DATA CAPTURE & CODING METHOD
ST	single-line stream • Any single, solid or dashed, blue line that is not labeled on a DRG or paper quad as some other linear type, does not serve as a shoreline or water area boundary of some kind, and does not fit any other decision rule. • Streams may have sections to them that are ditch/canals; however, all of that feature should just be coded as stream. • Sometimes at the intersection of water features and roads, there is no blue line indicating flow under the road, even though we are confident that there is a culvert under the road and that the stream continues. Therefore, a single-line stream is added to connect the water features, so flow is shown to continue, and an unbroken dendritic network is provided • Sometimes the DRG or quad may not actually show the stream connected to the outlet part of a reservoir/flowage, so similarly to the previous situation, just add the connection and code it as ST.	Vectorize sufficient points to smoothly define feature.  (Note: See duration for linear symbol description.)   
UN	unknown • Any linear feature from a USGS 7.5' quad that is not identifiable as any other linear type. It is also used for the internal Fish Hatchery line work.	

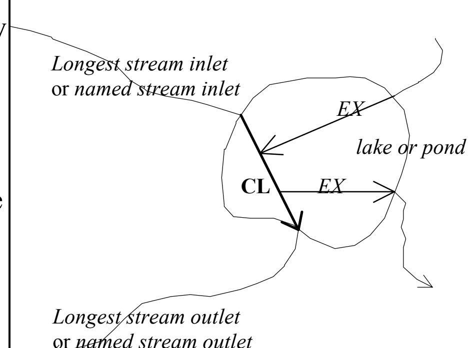
Wisconsin DNR 24K Hydrography
DECISION RULES

<table>
<tr><th colspan="3">LINEAR TYPE
--VISUALLY DETERMINED—</th></tr>
<tr><th>CODE</th><th>DESCRIPTION INFORMATION</th><th>DATA CAPTURE & CODING METHOD</th></tr>
<tr><td colspan="3">DNR features (hydro features created and coded based on DNR decision rules)</td></tr>
<tr><td>BF</td><td>state boundary buffer
• A buffer line delineating the 1000 meter buffer around the state boundary
• Hydro features up to 1000 meters will be included in the layer, and a buffer line is added to close off the upland and water polygons.</td><td>
</td></tr>
<tr><td>CL</td><td>stream centerline

• Provides an unbroken dendritic network for flow modeling.
• Centerlines only approximate the center of the open water polygon they dissect.
• Centerlines are NOT intended to depict navigational paths in any way, but are created in order to model stream connectivity.
• Centerlines follow the shortest and widest path through open water polygons when multiple paths are present.

• When multiple streams flow into and out of a water polygon, then the centerlines are determined by looking on the DRG or quad for named streams. Named streams take precedence in determining which feature receives the CL. If none or all of the streams have names, then the CL goes to the streams that have the longest path coming in and out of the water polygon.</td><td>Heads-up digitize a line through approx. midpoint of all double-line river channels and other open water polygons through which a stream flows. Snap endpoints of centerlines to required single-line representations of stream features at the inlets and outlets.


double-line stream
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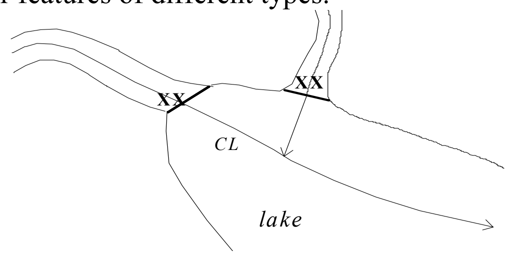
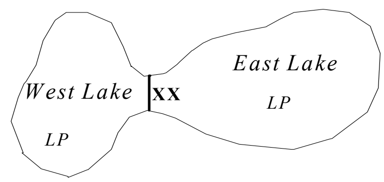
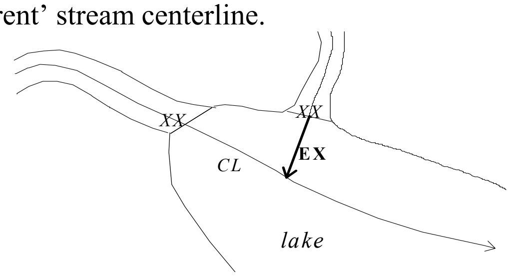
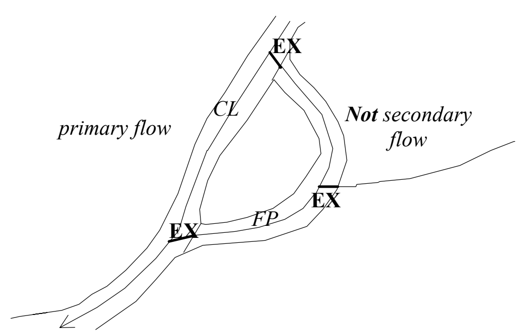
Wisconsin DNR 24K Hydrography
DECISION RULES

LINEAR TYPE
--VISUALLY DETERMINED—

CODE	DESCRIPTION INFORMATION	DATA CAPTURE & CODING METHOD
XX	closure line • Line segments, which separate adjacent open water features of different types or names.	Heads-up digitize a "cut-off" line between adjacent open water features of different types.  
EX	stream extension • Provides unbroken dendritic network for flow modeling. • Occurs where a tributary stream enters an open water polygon with an established through-flow. • Similar to centerlines, but occurs at confluences of streams and, sometimes, at beginnings of streams. Always are connected to lines coded 'ST', 'DC', 'CL', or 'FP'. • This is an example of an extension connecting flow from a centerline to a flow potential, and then extending again from the flow potential. If a stream is extending into a channel, it will meet with a flow potential. This is the only case where an extension will not extend to a centerline.	Heads-up digitize a line between the mouth of the tributary stream and its 'parent' stream centerline. Snap endpoints of the stream extension to the mouth of the single-line tributary (or tributary centerline) and to the 'parent' stream centerline.  

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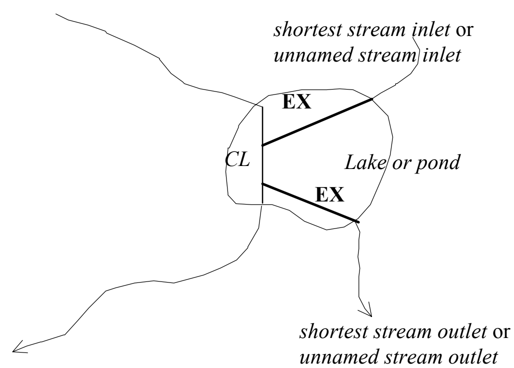
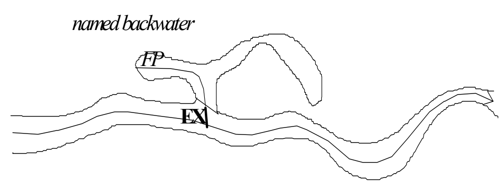
--VISUALLY DETERMINED—</th></tr>
<tr><th>CODE</th><th>DESCRIPTION INFORMATION</th><th>DATA CAPTURE & CODING METHOD</th></tr>
<tr><td>EX cont'd.</td><td>

- When multiple streams flow into and out of a water polygon, then the extensions are determined by looking on the DRG or quad for named streams. Named streams take precedence in determining which feature receives CLs; so, if none or all of the streams have names, then the EX goes to the streams that have the shortest path coming in and out of the water polygon.
- An example of an extension coming from a flow potential in a named backwater.

</td><td>





</td></tr>
<tr><td>FP</td><td>

flow potential

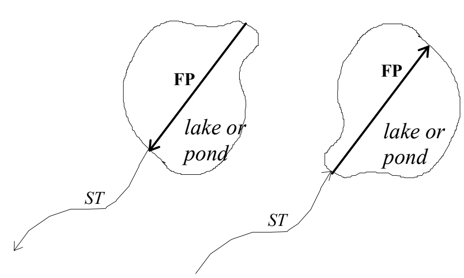
- Provides an unbroken dendritic network for flow modeling
- Occurs where the flow is uncertain, but possible
- There are 7 different cases for flow potentials to occur.

1) Occurs within an open water polygon that has an outlet but not an inlet, or an inlet but no outlet.

</td><td>

Below are examples of the seven possible occurrences of flow potentials:

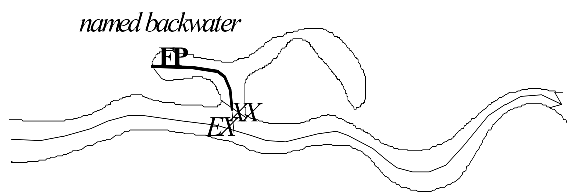
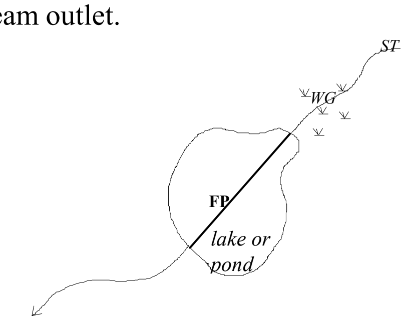
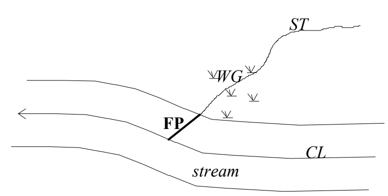
1) Heads-up digitize a line through approx. midpoint of all open water polygons that have an outlet but not an inlet (or an inlet but no outlet). Snap endpoints to the intersection where the stream flows out and to the water polygon bank across from that intersection.



</td></tr>
</table>

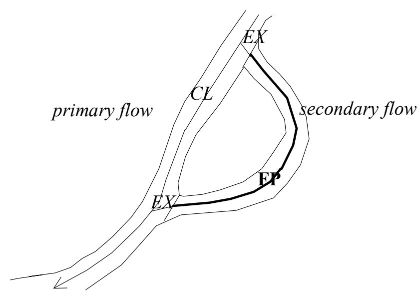
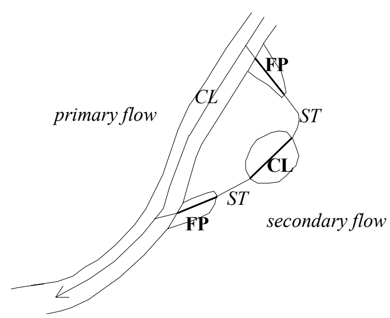
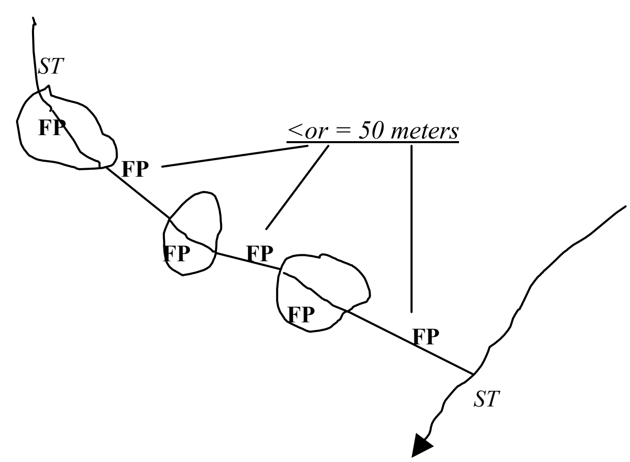
Wisconsin DNR 24K Hydrography
DECISION RULES

LINEAR TYPE
--VISUALLY DETERMINED—

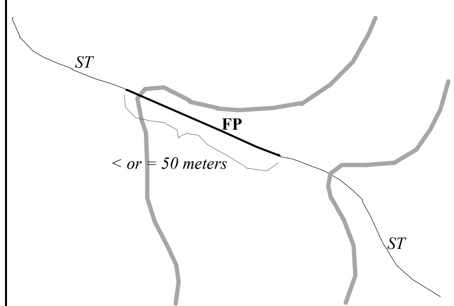
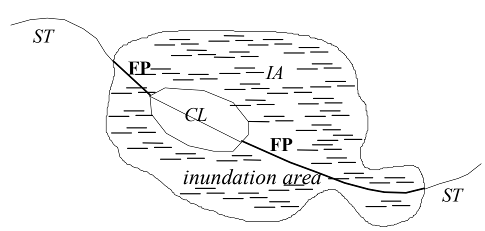
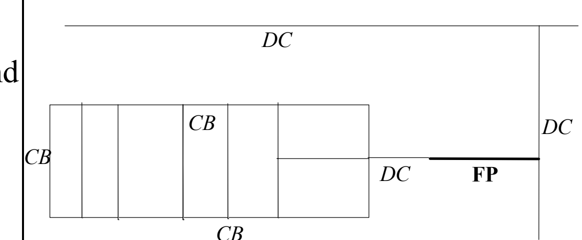
CODE	DESCRIPTION INFORMATION	DATA CAPTURE & CODING METHOD
FP cont'd		2) Heads-up digitize a line down the middle of the named backwater polygon from the "upstream" end, to the closure line. From the closure line, connect an extension to the centerline of the main stream.
	2) Occurs in *named* backwaters only	
		3) Heads-up digitize a line between the mouth of the wetland gap and its 'parent' stream or centerline. Snap endpoint to wetland gap inlet and another flow potential or stream outlet. 
	3) Occurs where a tributary stream potentially flows through an adjacent wetland and into an open water polygon.	

Wisconsin DNR 24K Hydrography
DECISION RULES

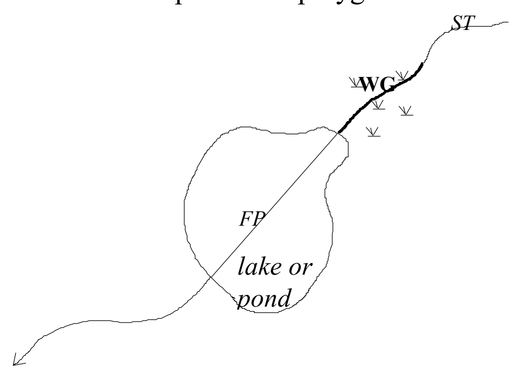
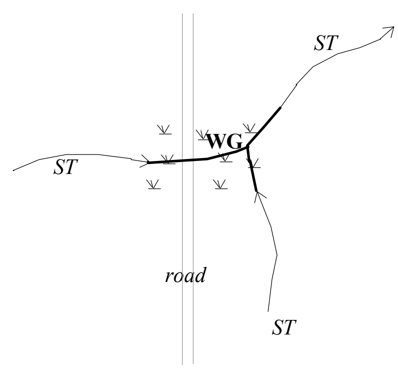
LINEAR TYPE
--VISUALLY DETERMINED—

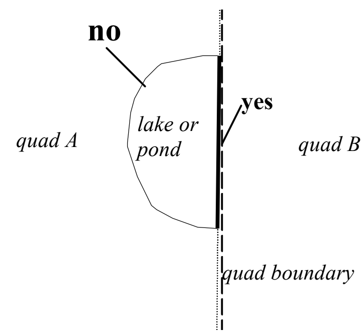
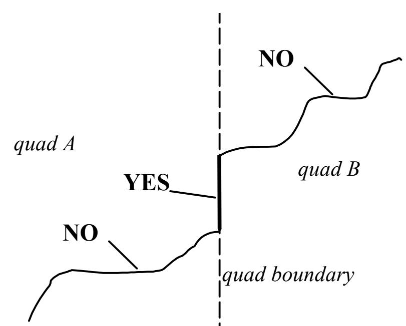
CODE	DESCRIPTION INFORMATION	DATA CAPTURE & CODING METHOD
FP *cont'd*	4) Occurs in a polygonal secondary channel (similar to a centerline, except that the water polygon in which it occurs is coded as a secondary channel).	4) Heads up digitize a line from the inlet extension in the primary channel, through the center of the secondary channel to the outlet extension in the primary channel. Be sure to snap the flow potential line to the node in the closure line.  
	5) Occurs where there is a gap between two or more hydro features, and the contour lines indicate a downhill slope, but no wetlands exist between the features; a flow potential is added as long as the distance between the hydro features is equal to or less than 50meters.	5) Heads up digitize a line from the hydro feature to the other, following the slope and direction of the contour lines. 

LINEAR TYPE
--VISUALLY DETERMINED—

CODE	DESCRIPTION INFORMATION	DATA CAPTURE & CODING METHOD
FP cont'd	6) Connects streams through strings of lake ponds when distances between lake ponds have the same criteria as previous example (5).	6) 
	7) Connects through Inundation Areas	7) Heads-up digitize a line from the single-line stream coming into the inundation area to the edge of the lake/pond. 
	8) Connects cranberry bog channels to main channels and the dendritic network	8) Heads-up digitize a line from a cranberry bog channel to one of the main channels that is a part of the network. 

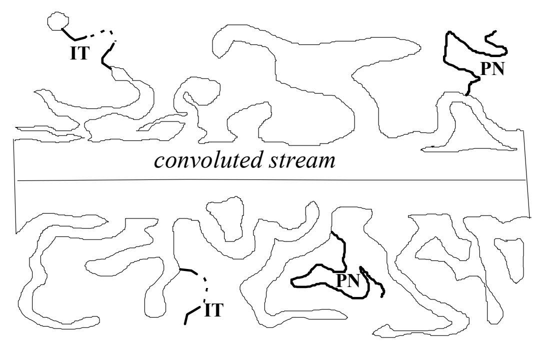
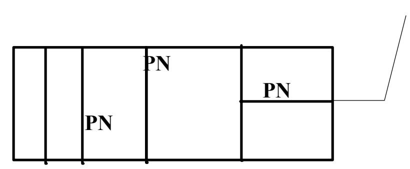
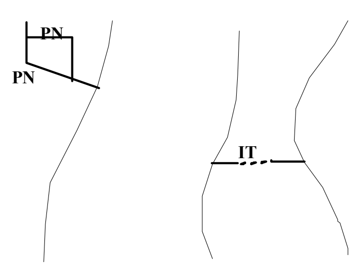
Wisconsin DNR 24K Hydrography
DECISION RULES

LINEAR TYPE --VISUALLY DETERMINED—		
CODE	DESCRIPTION INFORMATION	DATA CAPTURE & CODING METHOD
WG	wetland gap connector • Provides an unbroken dendritic network for flow modeling. • Connects two water features that are separated by a wetland but appear to have the same flow path. • Can pass over contours as long as the contours indicate downhill flow. • There is no distance limit for adding wetland gap connectors. • If a road passes through a wetland, and streams flow in and out of the wetland area, flow probably exists through a culvert; therefore, add the wetland gap connector across the road	Heads-up digitize a line between water features that are separated by a wetland and are within the same contour line. Snap endpoints to single-line streams or flow potential lines within open water polygons.  

QUADLINE --VISUALLY DETERMINED--		
LTYP	DESCRIPTION INFORMATION	CODING METHOD
Hydro features (features coded based on USGS quad representations)		
Any	YES or NO ▪ YES closes off water polygons at quadrangle boundaries when the water polygons may not match from one quad to the next. • added during the quad edgematching process ▪ NO for all other line work.	Heads-up digitize a line that closes off water polygons that may not continue onto the next quad, or if the water polygons do not match. Any line that meets these criteria is given the LTYP of the arcs that make up the rest of the polygon and coded YES for the QUADLINE item.  

Wisconsin DNR 24K Hydrography
DECISION RULES

LINEAR DURATION (BY LINEAR TYPE)
--SOME AUTOMATED, SOME VISUALLY DETERMINED--

LTYPE	DESCRIPTION INFORMATION	CODING METHOD
Hydro features (features coded based on USGS quad representations)		
BK	NA (not applicable) • VISUALLY DETERMINED/AUTOMATED	• Initially, banks are visually determined, with duration of either IT or PN. Those duration codes are used to populate the polygon in which those arcs surround. Then, in an automated process, the bank durations are coded as NA.
CW	NA (not applicable)	• AUTOMATED
ZZ	IT or PN (intermittent or perennial)	• VISUALLY DETERMINED 
CB	PN (perennial)	• AUTOMATED 
DC	IT or PN (intermittent or perennial)	• VISUALLY DETERMINED 

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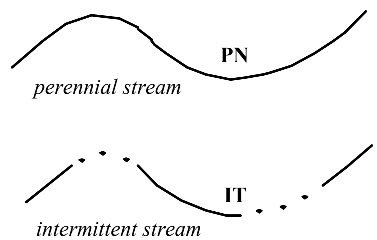
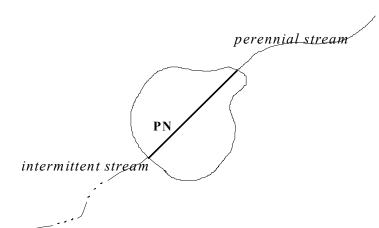
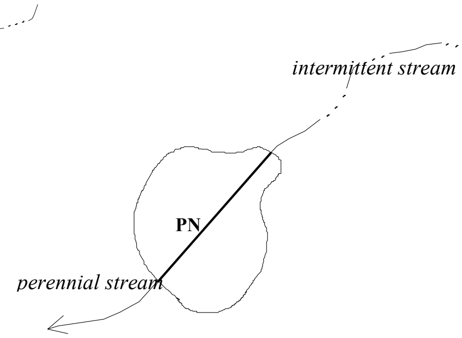
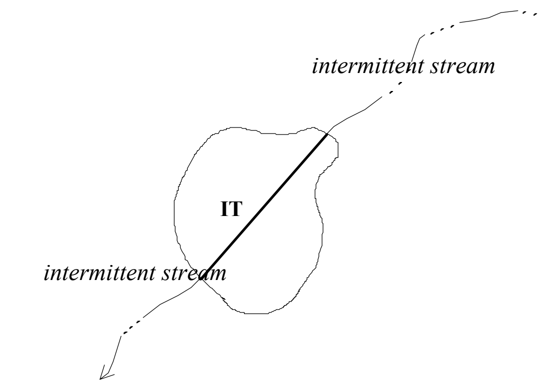
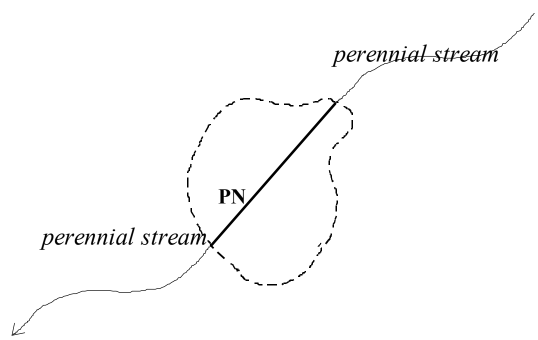
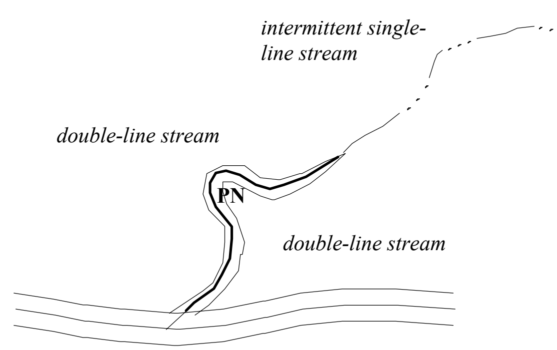
DECISION RULES

LINEAR DURATION (BY LINEAR TYPE)
--SOME AUTOMATED, SOME VISUALLY DETERMINED--

LTYPE	DESCRIPTION INFORMATION	CODING METHOD
OC	NA (not applicable)	• AUTOMATED
ST	IT or PN (intermittent or perennial)	• VISUALLY DETERMINED 
UN	NA (not applicable) AUTOMATED	• VISUALLY DETERMINED
DNR features (hydro features coded based on DNR decision rules)		
BF	NA (not applicable)	• AUTOMATED
CL	IT or PN (intermittent or perennial) • Perennial takes precedence • if the inlet stream is perennial and the outlet stream is intermittent, the centerline is perennial • if the inlet stream is intermittent and the outlet stream is perennial, the centerline is perennial	• AUTOMATED  

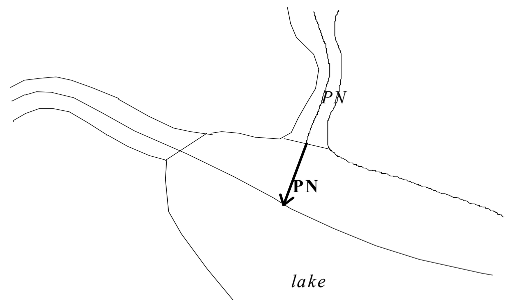
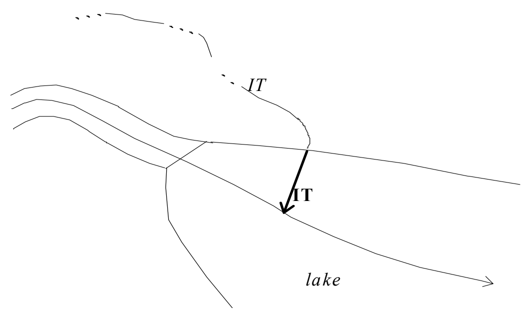
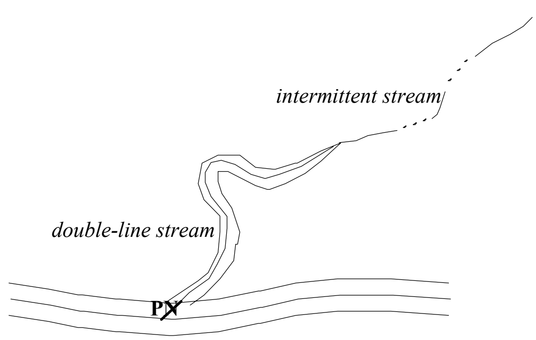
Wisconsin DNR 24K Hydrography
DECISION RULES

LINEAR DURATION (BY LINEAR TYPE)
--SOME AUTOMATED, SOME VISUALLY DETERMINED--

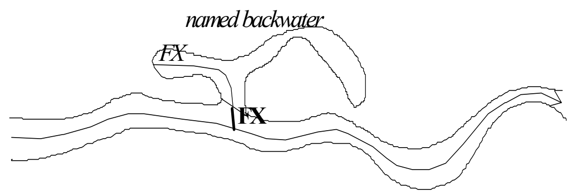
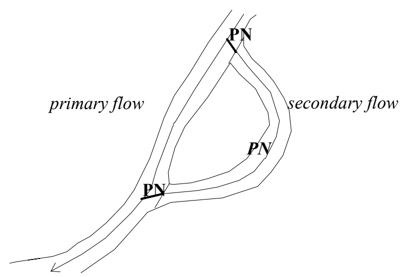
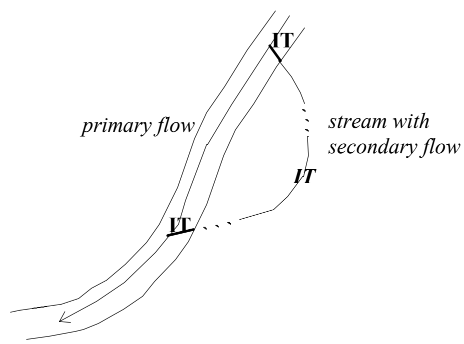
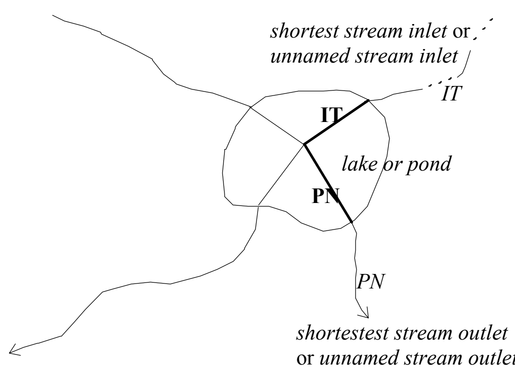
LTYPE	DESCRIPTION INFORMATION	CODING METHOD
CL cont'd	• if the inlet and outlet streams are both intermittent, then the centerline is intermittent.	
	• coding of the centerline is always determined by the duration of inlet and outlet streams, and follows the rules of perennial taking precedence, EVEN IF the water polygon that the stream is running through is intermittent.	
	• if an intermittent stream becomes a double-line stream, then the centerline is perennial.	
XX	NA (not applicable)	• AUTOMATED

Wisconsin DNR 24K Hydrography
DECISION RULES

LINEAR DURATION (BY LINEAR TYPE)
--SOME AUTOMATED, SOME VISUALLY DETERMINED--

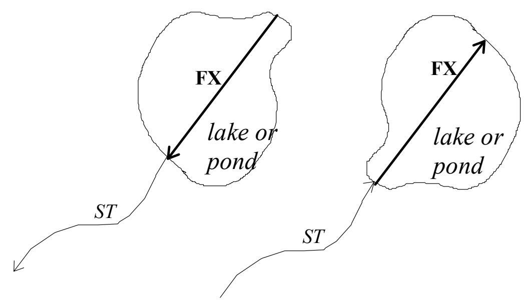
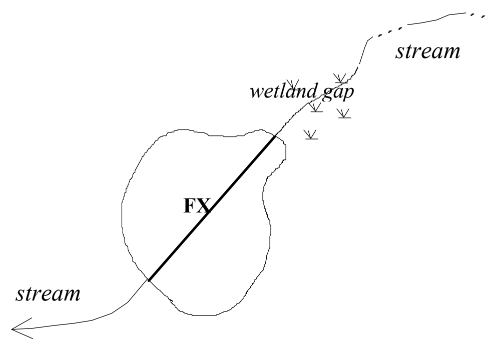
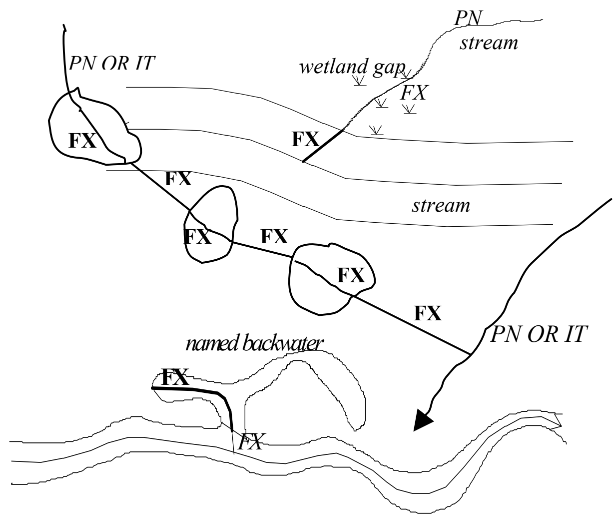
LTYPE	DESCRIPTION INFORMATION	CODING METHOD
EX	IT or PN, or FX (intermittent or perennial)	• AUTOMATED
	• PN when the extension stems from a perennial stream.	
	• IT when an extension stems from an intermittent stream.	
	• PN when an extension follows an intermittent stream but flows into a double-line stream (which, in itself, is PN).	

LINEAR DURATION (BY LINEAR TYPE)
--SOME AUTOMATED, SOME VISUALLY DETERMINED--

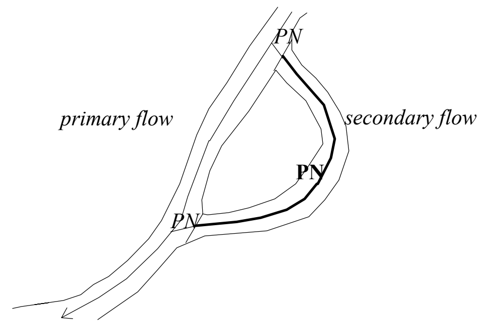
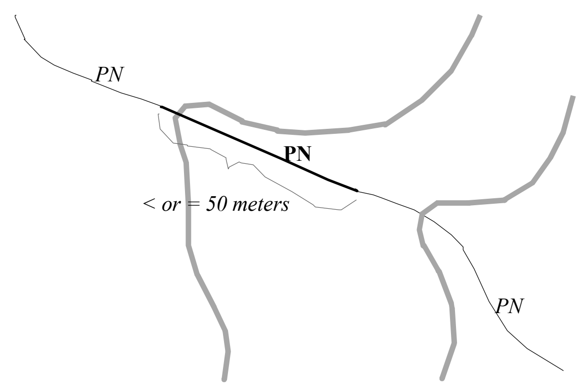
LTYPE	DESCRIPTION INFORMATION	CODING METHOD
EX cont'd.	• FX when an extension stems from a flow potential in a named backwater.	
	• PN when an extension goes into and stems from a perennial, secondary flow potential.	
	• IT when an extension goes into and stems from an intermittent secondary flow stream.	
	• the extension takes on the duration of the stream, ditch/canal, or centerline it is extending to or from	

Wisconsin DNR 24K Hydrography
DECISION RULES

LINEAR DURATION (BY LINEAR TYPE)
--SOME AUTOMATED, SOME VISUALLY DETERMINED--

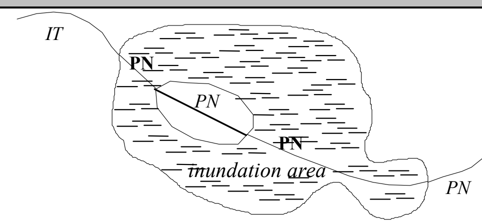
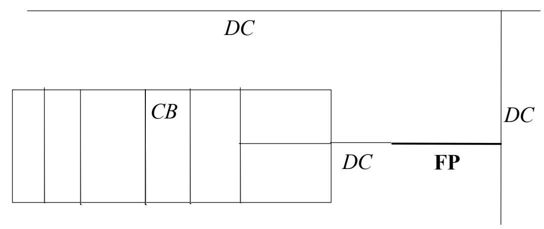
LTYPE	DESCRIPTION INFORMATION	CODING METHOD
FP	PN, IT, or FX (perennial, intermittent, or fluctuating)	• AUTOMATED
	• FX when in a headwater lake/pond, or in a lake/pond with only inlets and no outlets.	
	• FX when following a wetland gap connector.	
	• FX when in a named backwater.	
FP		

LINEAR DURATION (BY LINEAR TYPE)
--SOME AUTOMATED, SOME VISUALLY DETERMINED--

LTYPE	DESCRIPTION INFORMATION	CODING METHOD
cont'd	• PN when in a secondary flow.	
	• IT or PN (intermittent or perennial) when outside of a water polygon. If either stream that the flow potential is connecting is perennial, then the duration is perennial (perennial takes precedence). If both streams are intermittent, the duration is intermittent.	
	• FX when Flow Potentials are used to connect a series of Lake Ponds to a stream or river.	

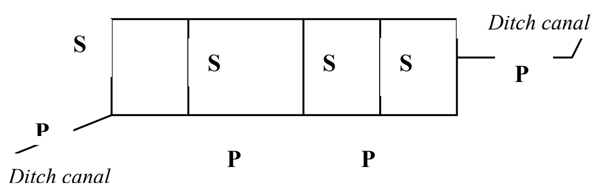
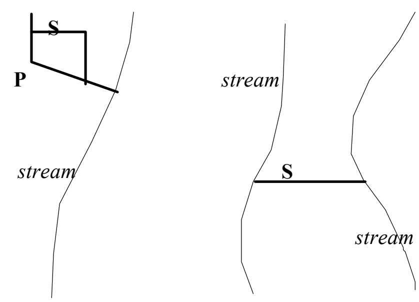
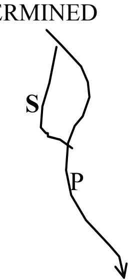
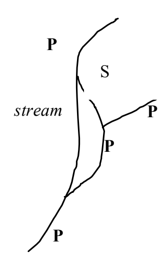
Wisconsin DNR 24K Hydrography
DECISION RULES

LINEAR DURATION (BY LINEAR TYPE)
--SOME AUTOMATED, SOME VISUALLY DETERMINED--

LTYPE	DESCRIPTION INFORMATION	CODING METHOD
	• IT or PN (intermittent or perennial) when running through an inundation area. If either stream that the flow potential is connecting is perennial, then the duration is perennial (perennial takes precedence). If both streams are intermittent, the duration is intermittent.	
	• FX when connecting a cranberry bog to a main waterway.	

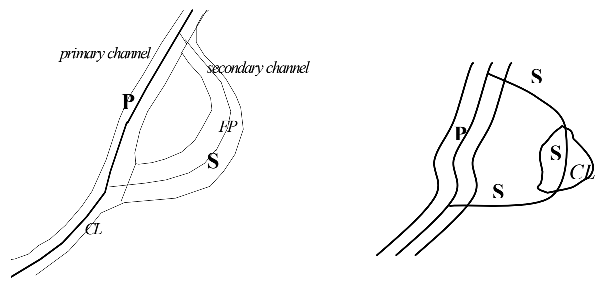
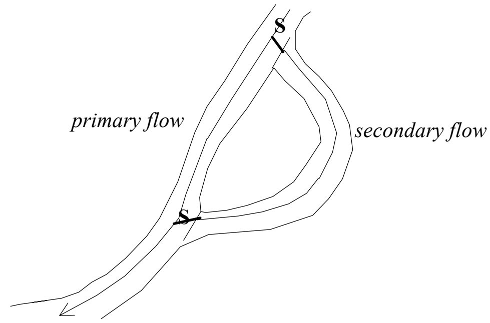
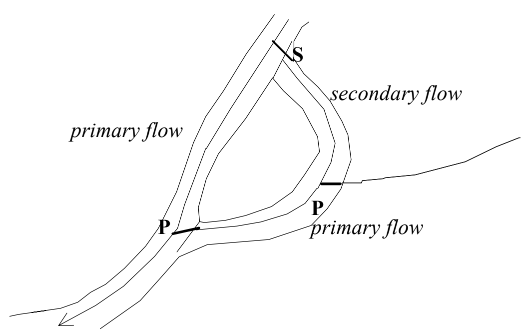
Wisconsin DNR 24K Hydrography
DECISION RULES

FLOW (BY LINEAR TYPE)
--SOME AUTOMATED, SOME VISUALLY DETERMINED--

LTYPE	DESCRIPTION INFORMATION	VECTORIZING/DIGITIZING & CODING METHOD
Hydro features (features coded based on USGS quad representations)		
BK,CW, OC, UN ZZ	NA (not applicable)	• AUTOMATED
CB	P(Primary) or S(Secondary)	• AUTOMATED AND VISUALLY DETERMINED 
DC	P(Primary) or S(Secondary) • VISUALLY DETERMINED • When a ditch/canal strays from the main flow and then re-connects, code the ditch/canal as secondary flow	
ST	P(Primary) or S(Secondary) • When a stream strays from the main flow and then re-connects, code the stream as secondary flow • If another stream empties into the "secondary channel", it considered a 'secondary flow' until the incoming stream meets the 'secondary flow' to become 'primary flow'	• VISUALLY DETERMINED  
DNR features (hydro features coded based on DNR decision rules)		

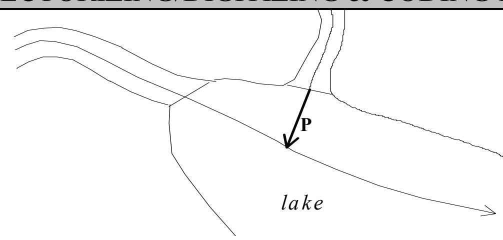
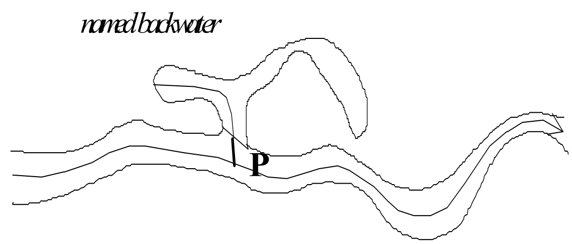
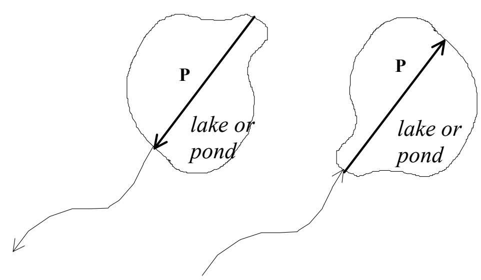
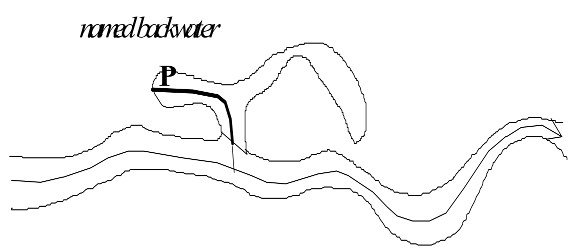
Wisconsin DNR 24K Hydrography
DECISION RULES

FLOW (BY LINEAR TYPE)
--SOME AUTOMATED, SOME VISUALLY DETERMINED--

LTYPE	DESCRIPTION INFORMATION	VECTORIZING/DIGITIZING & CODING METHOD
BF, XX	NA (not applicable)	• AUTOMATED
CL	P or S • AUTOMATED • If a connectivity feature is in a secondary channel, that feature will be a Flow Potential.	
EX	P(Primary) or S(Secondary) • SECONDARY when extending to and from a flow potential in a secondary flow stream • PRIMARY when there is a new stream entering the secondary channel. If another stream empties into the "secondary channel", the 'secondary channel' has a SECONDARY flow value until it meets the primary flow of the incoming stream where it becomes PRIMARY.	• VISUALLY DETERMINED  
EX	• PRIMARY when extending from	

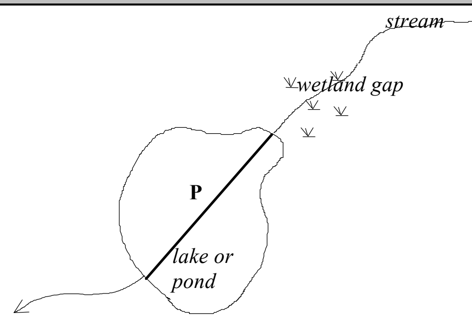
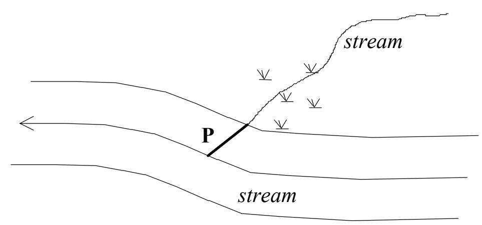
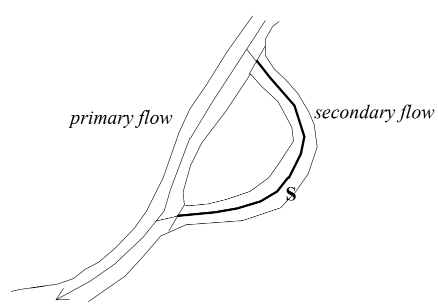
Wisconsin DNR 24K Hydrography
DECISION RULES

FLOW (BY LINEAR TYPE)
--SOME AUTOMATED, SOME VISUALLY DETERMINED--

LTYPE	DESCRIPTION INFORMATION	VECTORIZING/DIGITIZING & CODING METHOD
cont'd.	a non-secondary flow stream	
	• PRIMARY when extending from a named backwater	
FP	PRIMARY OR SECONDARY	• VISUALLY DETERMINED
	• P when a flow potential is within a water poly with an outlet and no inlet, or with an inlet and no outlet	
	• P when a flow potential is within named backwater	

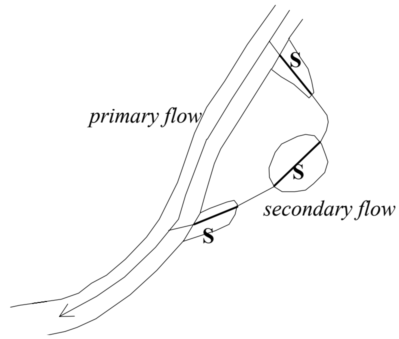
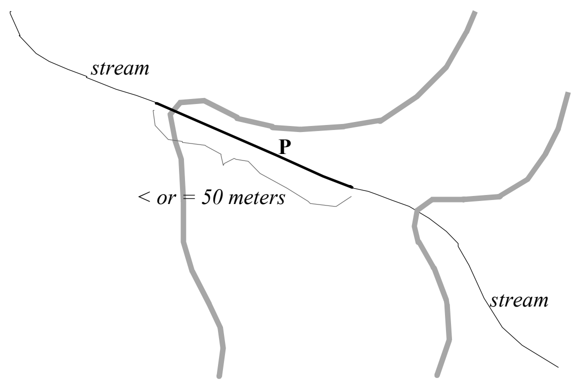
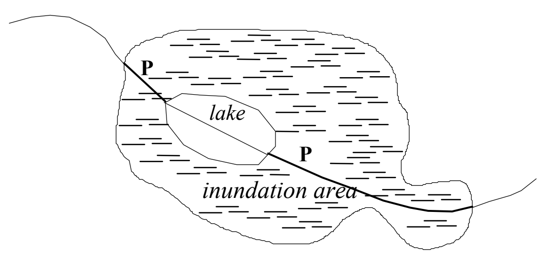
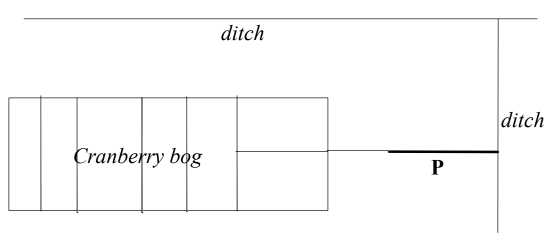
Wisconsin DNR 24K Hydrography
DECISION RULES

FLOW (BY LINEAR TYPE)
--SOME AUTOMATED, SOME VISUALLY DETERMINED--

LTYPE	DESCRIPTION INFORMATION	VECTORIZING/DIGITIZING & CODING METHOD
FP cont'd.	• PRIMARY when a flow potential is followed by a wetland gap	
	• P when a flow potential is followed by a wetland gap	
	• S when a flow potential falls within a secondary flow	

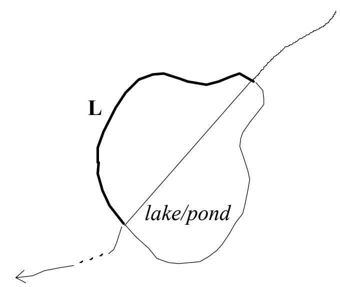
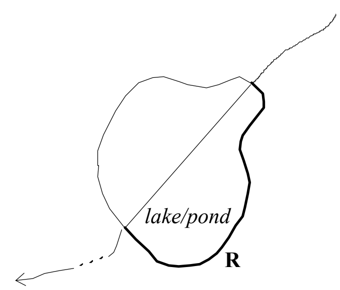
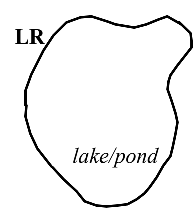
Wisconsin DNR 24K Hydrography
DECISION RULES

FLOW (BY LINEAR TYPE)
--SOME AUTOMATED, SOME VISUALLY DETERMINED--

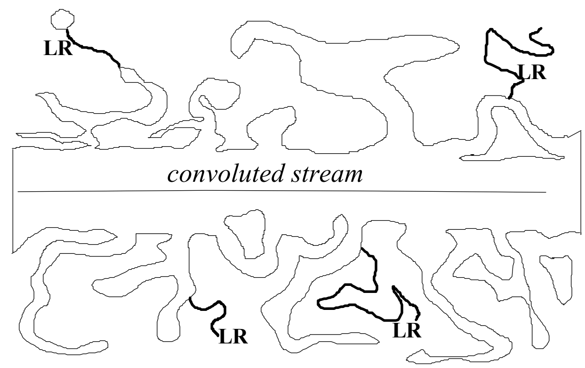
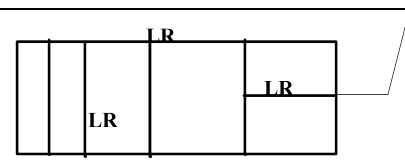
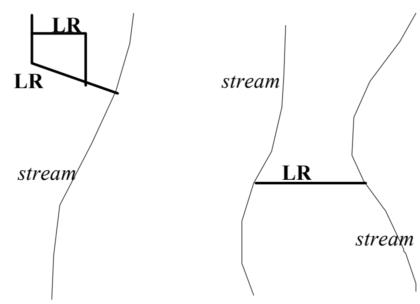
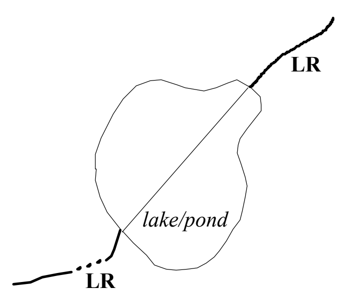
LTYPE	DESCRIPTION INFORMATION	VECTORIZING/DIGITIZING & CODING METHOD
FP cont'd	• PRIMARY when a flow potential occurs outside of a water polygon	
	• PRIMARY when running through inundation areas	
	• PRIMARY when connecting cranberry bog channels to main channels	 

Wisconsin DNR 24K Hydrography
DECISION RULES

LEFT/RIGHT BANK (BY LINEAR_TYPE)
--ALL AUTOMATED--

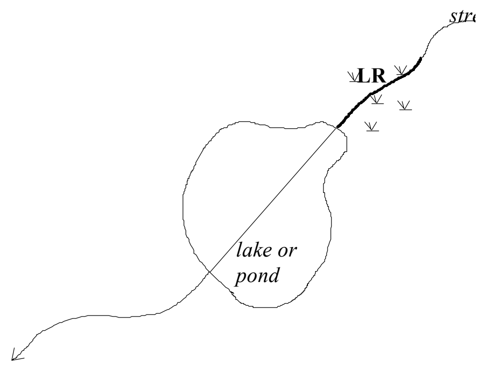
LTYPE	DESCRIPTION INFORMATION	VECTORIZING/DIGITIZING & CODING METHOD
Hydro features (features coded based on USGS quad representations)		
BK	L,R, or LR (left, right, or left/right) • L or R: Banks of all water polygons with transport features running through them. Represents side of bank when looking upstream of polygon. • LR: Any water polygon that does not have a transport feature running through it (i.e., those water polygons that are landlocked and do not have a centerline or flow potential line)	  
CW, OC, UN	Not Applicable –(NA)	

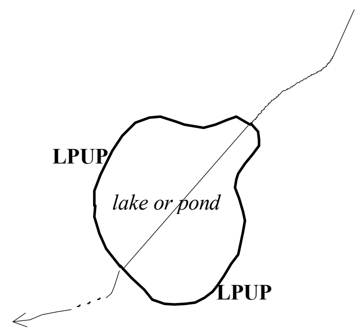
Wisconsin DNR 24K Hydrography
DECISION RULES

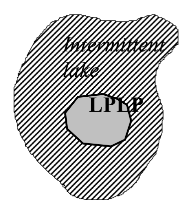
LEFT/RIGHT BANK (BY LINEAR_TYPE) --ALL AUTOMATED--		
LTYPE	DESCRIPTION INFORMATION	VECTORIZING/DIGITIZING & CODING METHOD
ZZ	LR	
CB	LR	
DC	LR	
ST	LR	
DNR features (hydro features coded based on DNR decision rules)		
BF, CL, XX, EX,FP	Not Applicable –(NA)	

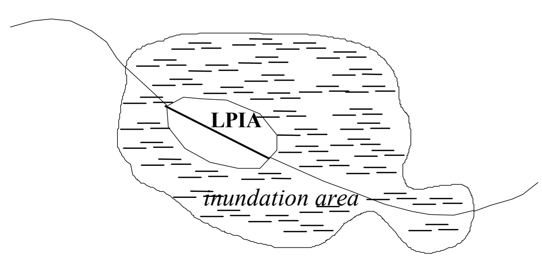
Wisconsin DNR 24K Hydrography
DECISION RULES

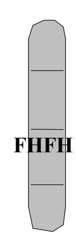
LEFT/RIGHT BANK (BY LINEAR_TYPE)
--ALL AUTOMATED--

LTYPE	DESCRIPTION INFORMATION	VECTORIZING/DIGITIZING & CODING METHOD
WG	LR	

<table>
<tr><td colspan="3">AREA BOUNDARY TYPE (BY LINEAR_TYPE)
--ALL AUTOMATED--</td></tr>
<tr><td colspan="3">The area boundary type code is a concatenation of the poly_type codes detailed on either side of a line. Every line has an area_bnd_type code. Below is one example of an area_bnd_type for every linear_type</td></tr>
<tr><td>LTYPE</td><td>DESCRIPTION INFORMATION</td><td>VECTORIZING/DIGITIZING & CODING METHOD</td></tr>
<tr><td colspan="3">Hydro features (features coded based on USGS quad representations)</td></tr>
<tr><td>BK</td><td>UPLP, LPLP, LPIA, FHFH, RFUP, ISRF, IAUP, IAIS
• A lake/pond is on one side of the line, and an upland is on the other side.
• An inundation area is on one side of the line, and an island or upland on the other.
• A reservoir/flowage is on one side of the line, and an island or upland on the other.</td><td>






</td></tr>
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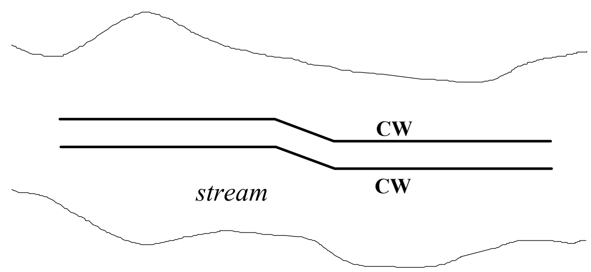
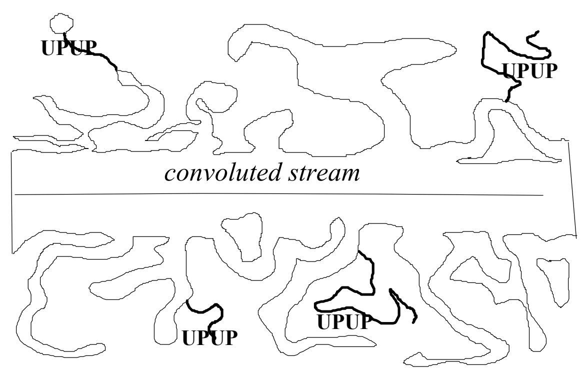
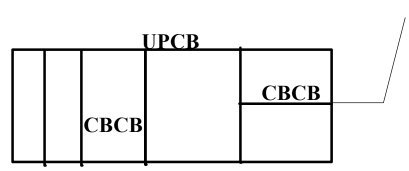
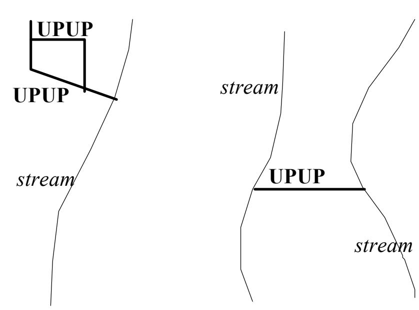
Wisconsin DNR 24K Hydrography
DECISION RULES

AREA BOUNDARY TYPE (BY LINEAR_TYPE)
--ALL AUTOMATED--

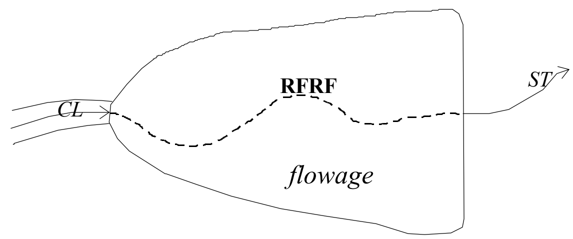
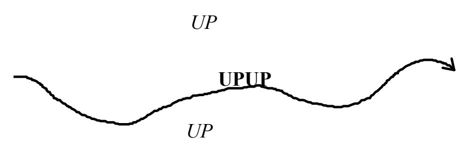
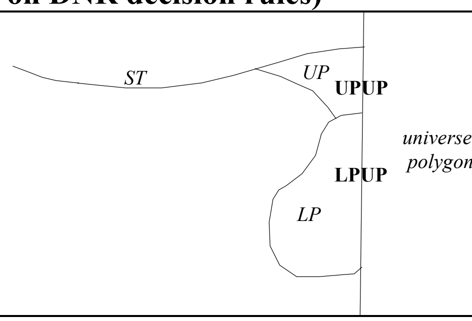
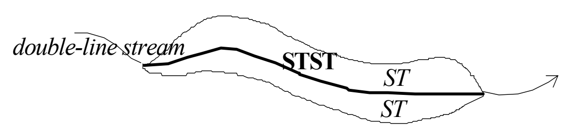
The area boundary type code is a concatenation of the poly_type codes detailed on either side of a line. Every line has an area_bnd_type code. *Below is one example of an area_bnd_type for every linear_type*

LTYPE	DESCRIPTION INFORMATION	VECTORIZING/DIGITIZING & CODING METHOD
CW	STST • The stream is on both sides of the channel	
ZZ	UPUP • Uplands are on both sides of the line.	
CB	UPCB or CBCB • A cranberry bog polygon is on one side of the line, and an upland is on the other side of the line	
DC	UPUP or ISIS • Uplands are on both sides of the line • Ditch running through an island	

Wisconsin DNR 24K Hydrography
DECISION RULES

AREA BOUNDARY TYPE (BY LINEAR_TYPE)
--ALL AUTOMATED--

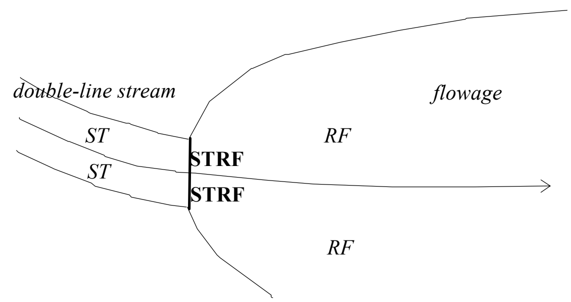
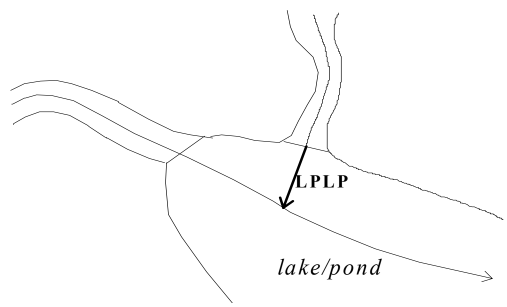
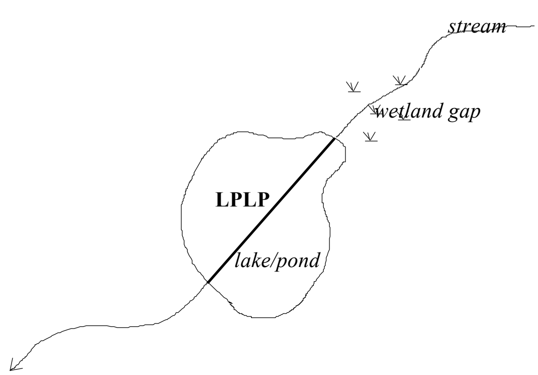
The area boundary type code is a concatenation of the poly_type codes detailed on either side of a line. Every line has an area_bnd_type code. *Below is one example of an area_bnd_type for every linear_type*

LTYPE	DESCRIPTION INFORMATION	VECTORIZING/DIGITIZING & CODING METHOD
OC	RFRF • Reservoir/flowage polygons are on both sides of the line.	
ST	UPUP or ISIS • Uplands are on both sides of the line. • One large island on both sides of the line.	
UN	UPUP (most likely) • Can be almost any combination, but will probably be a single line that is undeterminable, therefore having uplands on both sides	
DNR features (hydro features coded based on DNR decision rules)		
BF	UPUP or UPLP, etc. • Can be many combinations, but UP will always be in every combination • The universe polygon will be considered an upland polygon	
CL	STST, etc. • Stream polygons are on both sides of the line.	

Wisconsin DNR 24K Hydrography
DECISION RULES

AREA BOUNDARY TYPE (BY LINEAR_TYPE)
--ALL AUTOMATED--

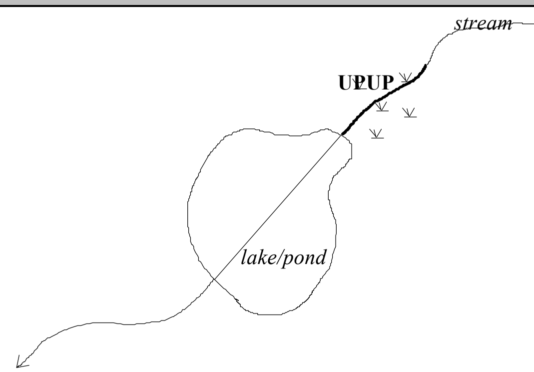
The area boundary type code is a concatenation of the poly_type codes detailed on either side of a line. Every line has an area_bnd_type code. *Below is one example of an area_bnd_type for every linear_type*

LTYPE	DESCRIPTION INFORMATION	VECTORIZING/DIGITIZING & CODING METHOD
XX	STRF, BADC, LPRF, RFRF, STST, LPLP, STLP, STBA, BARF, DCST, DCLP, RFDC, DCBA • A stream polygon is on one side of the line, and a reservoir/ flowage is on the other side of the line. • Many other situations involving closure lines.	
EX	LPLP, STST, RFRF, DCDC • A lake/pond polygon is on both sides of the line. • A double-line stream on both sides of the line. • A reservoir/flowage polygon on both sides of the line. • A ditch/channel polygon on both sides of the line.	
FP	LPLP, BABA, STST, UPUP, ISIS, DCDC • A lake/pond polygon is on both sides of the line. • A double-line stream on both sides of the line. • A NAMED backwater polygon on both sides of the line. • A ditch/channel polygon on both sides of the line. • An upland (universal) polygon on both sides of the line. • An island polygon on both sides of the line.	

Wisconsin DNR 24K Hydrography
DECISION RULES

AREA BOUNDARY TYPE (BY LINEAR_TYPE)
--ALL AUTOMATED--

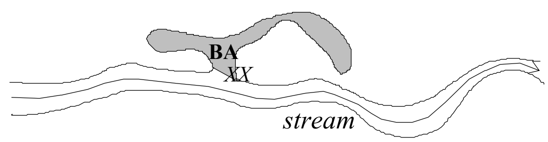
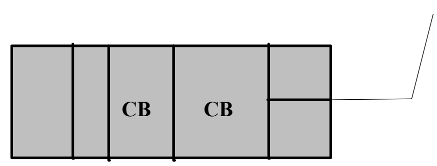
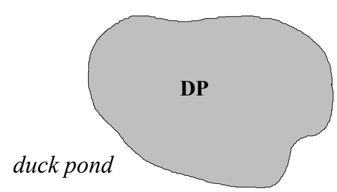
The area boundary type code is a concatenation of the poly_type codes detailed on either side of a line. Every line has an area_bnd_type code. *Below is one example of an area_bnd_type for every linear_type*

LTYPE	DESCRIPTION INFORMATION	VECTORIZING/DIGITIZING & CODING METHOD
WG	UPUP • Uplands are on both sides of the line.	

SECTION II
Wisconsin DNR 24K Hydrography
Polygon Decision Rules

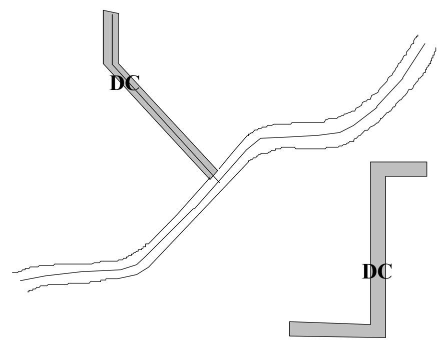
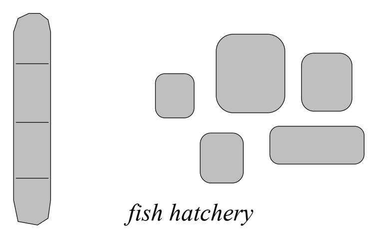
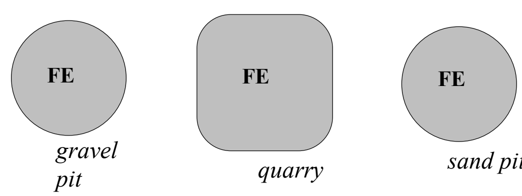
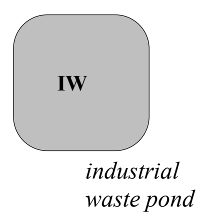
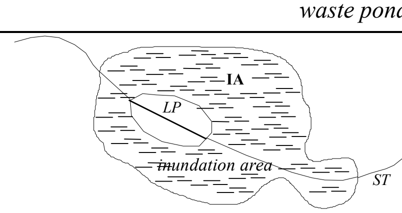
Wisconsin DNR 24K Hydrography
DECISION RULES

POLYGON TYPE
--ALL VISUALLY DETERMINED--

CODE	DESCRIPTION INFORMATION	CODING METHOD
Hydro features (features coded based on USGS quad representations)		
BA	Backwater • Open water polygons that are a part of double-line streams, but are 'closed off' (using a closure line) from the main channel because they follow most of the following four criteria: 1. labeled a backwater, slough, or bayou; 2. does not continue the through-flow for any part of the main river; 3. extends away from the main river channel at least as far as the main channel is wide; 4. does not serve as the point of entry for any tributary of the main river.	
CB	cranberry bog • Will appear on the quad as small squared-off polygons surrounded by water-filled ditches, or as a polygon labeled cranberry bog • Cranberry bog polygons are generally NOT shown as blue polygons on the quad.	
DP	duck pond • Any water polygon labeled on a DRG or paper quad as a duck pond **Currently, there are no polygons with this Polygon Type**	

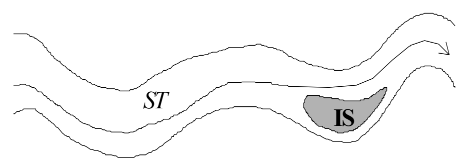
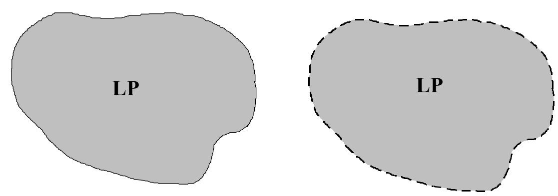
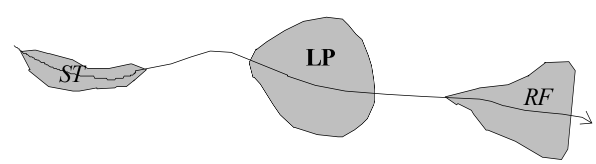
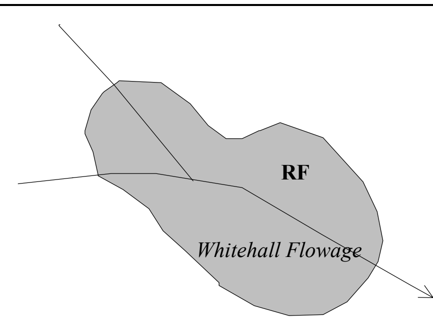
Wisconsin DNR 24K Hydrography
DECISION RULES

POLYGON TYPE
--ALL VISUALLY DETERMINED--

CODE	DESCRIPTION INFORMATION	CODING METHOD
DC	ditch/canal • Any polygon labeled on a DRG or paper quad as a ditch or canal, or any polygon defined by blue lines that follows man-made linear features or appears too straight to be termed a "natural" stream. • It is either disconnected from the dendritic network or a connected tributary of a stream, but it is not 'part of' a double-line stream.	
FH	fish hatchery or farm • Any water polygon labeled on a DRG or paper quad as a fish hatchery.	
FE	flooded excavation • Any water polygon labeled on a DRG or paper quad as a gravel pit, quarry or mine site. • An excavation found at mining sites that has filled with water	
IW	industrial waste pond • Any open water polygon that is labeled on a DRG or paper quad as industrial waste pond • Contains waste from industrial site	
IA	inundation area • An area near water which is subject to flooding and labeled as an inundation area.	

Wisconsin DNR 24K Hydrography
DECISION RULES

POLYGON TYPE
--ALL VISUALLY DETERMINED--

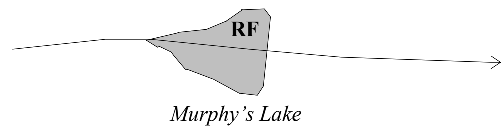
CODE	DESCRIPTION INFORMATION	CODING METHOD
IS	island • Any ‘land’ polygon that is labeled on a DRG or paper quad as an island, or any unlabeled, upland or forested ‘land’ polygon that is completely surrounded by open water polygons.	
LP	lake or pond • Any open water polygon that is labeled on a DRG or paper quad as a lake or pond, or any open water polygon that is not labeled as any other type of hydrography polygon feature and does not fit any other decision rules. (i.e. the default water polygon type). • When deciding to label a feature either as a double-line stream, a lake/pond, or reservoir/flowage, closely examine the width of the feature. If an obvious widening occurs in the water feature, and it does not fit the description of a reservoir/flowage, then label as a lake/pond. When in doubt between an ST and an LP, then call it an LP.	 (Note: See duration for quad line symbol description.) 
RF	reservoir or flowage • Any open water polygon that is labeled on a DRG or paper quad as a reservoir or flowage, or any open water polygon with a dam, lock, sluice gate or other structure controlling its water level.	

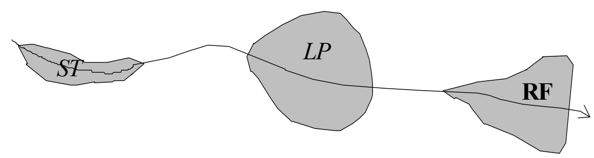
Wisconsin DNR 24K Hydrography
DECISION RULES

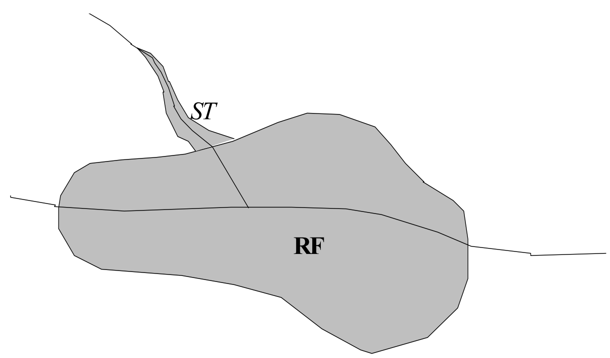
<table>
<tr><td colspan="3">POLYGON TYPE
--ALL VISUALLY DETERMINED--</td></tr>
<tr><th>CODE</th><th>DESCRIPTION INFORMATION</th><th>CODING METHOD</th></tr>
<tr><td>RF
cont’d.</td><td>

- Usually is a polygon that has a flattened appearance at the downstream end.
- Even though on the DRG or quad a water feature may be named a lake, if the feature fits the RF description, code it as an RF.
- When deciding to code a feature either as a double-line stream, a lake/pond, or reservoir/flowage, closely examine the width of the feature. If an obvious widening occurs in the water feature, and it does not fit the description of a reservoir/flowage, then code as a lake/pond. When in doubt between an ST or an LP, then call it an LP.
- If a double-line stream is entering into a reservoir/flowage, sometimes it is difficult to determine whether the widening part of the stream is actually part of the RF or not. Sometimes this really depends on how large the stream and RF are. A basic rule of thumb would be to imagine yourself in a boat on the different parts of the water features: where do you think you are - in the stream or in the reservoir? The answer is the feature code.

</td><td>







</td></tr>
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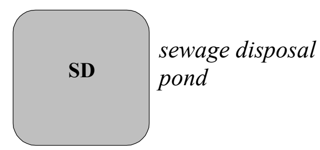
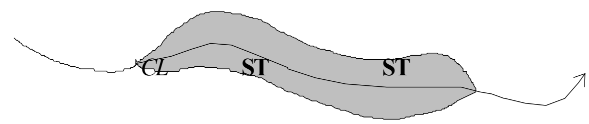
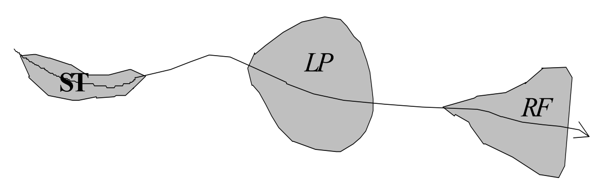
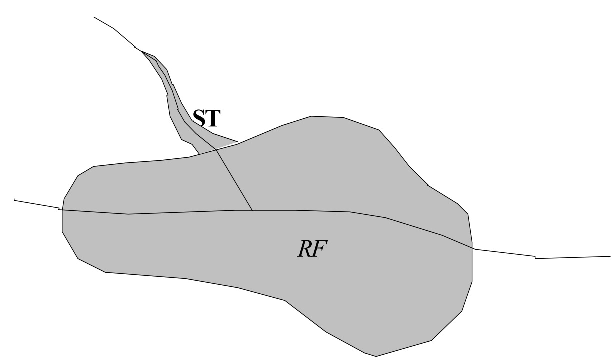
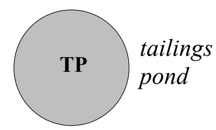
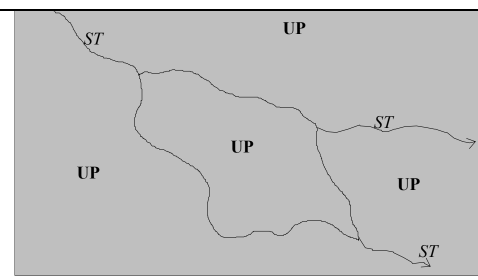
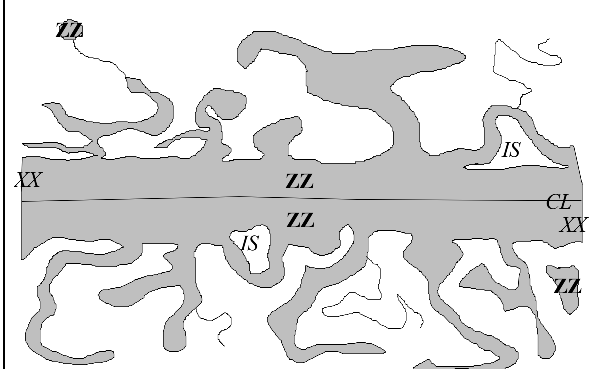
Wisconsin DNR 24K Hydrography
DECISION RULES

POLYGON TYPE
--ALL VISUALLY DETERMINED--

CODE	DESCRIPTION INFORMATION	CODING METHOD
SD	Sewage disposal pond	
ST	double-line stream • Any thin, open water polygon defined by solid blue lines that is not labeled on a DRG or paper quad as some other waterbody type, and does not fit any other decision rule. • When deciding to code a feature either as a double-line stream, a lake/pond, or reservoir/flowage, closely examine the width of the feature. If an obvious widening occurs in the water feature, and it does not fit the description of a reservoir/flowage, then code as a lake/pond. When in doubt between an ST and an LP, then call it an LP. • If a double-line stream is entering into a reservoir/flowage, sometimes it is difficult to determine whether the widening part of the stream is actually part of the RF or not. Sometimes this really depends on how large the stream and RF are. A basic rule of thumb would be to imagine yourself in a boat on the different parts of the water features: where do you think you are - in the stream or in the reservoir? The answer is the feature code.	  

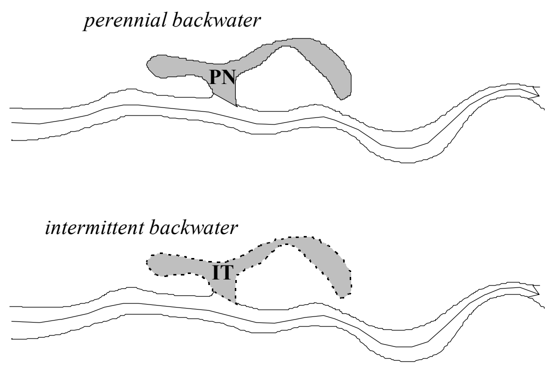
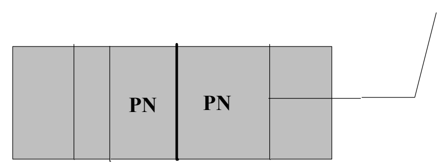
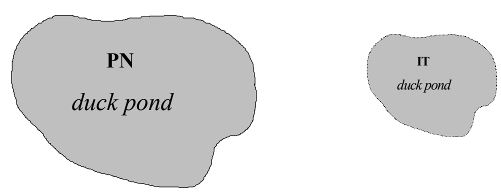
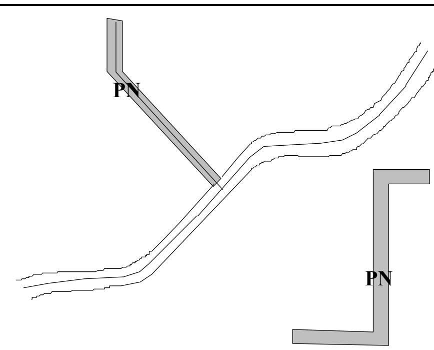
Wisconsin DNR 24K Hydrography
DECISION RULES

POLYGON TYPE
--ALL VISUALLY DETERMINED--

CODE	DESCRIPTION INFORMATION	CODING METHOD
TP	tailings pond • Any open water polygon that is labeled as a tailings pond. • An excavation found at mining site that has filled with industrial waste.	
UN	unknown • Any polygonal feature that is unidentifiable from the 7.5 minute USGS quad.	
UP	upland • All 'land' polygons other than islands, cranberry bogs or inundation areas.	
DNR features (hydro features coded based on DNR decision rules)		
ZZ	convoluted stream • A series of inter-connected waterways and small water polygons that become so complex that adding DNR features and coding is difficult. • All polygons within the convoluted area are coded as such, no matter what the features would normally be coded. • The beginning and ending of a convoluted stream is determined by closure lines separating the regular stream polygons from the convoluted stream area. • Any water polygon within the same contour of the convoluted stream, whether connected by other arcs or not, is still to be coded as convoluted.	

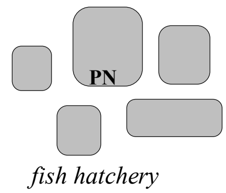
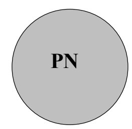
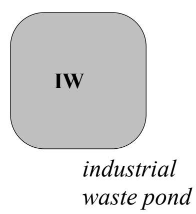
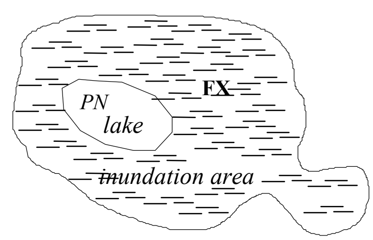
Wisconsin DNR 24K Hydrography
DECISION RULES

POLYGONAL DURATION (BY POLY TYPE)
--ALL AUTOMATED--

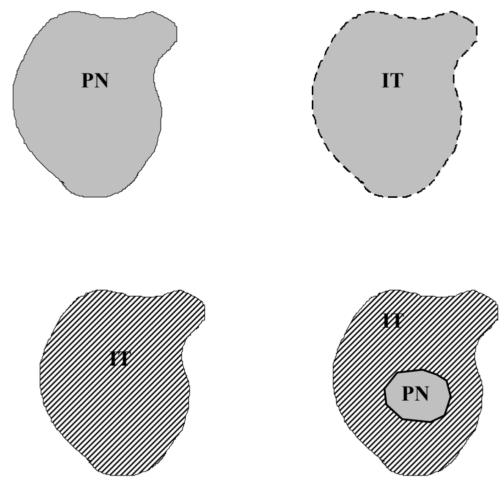
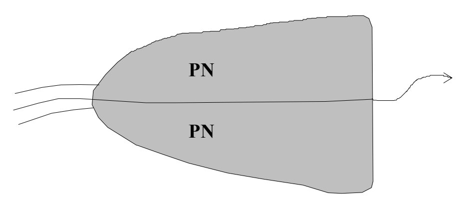
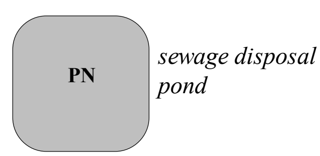
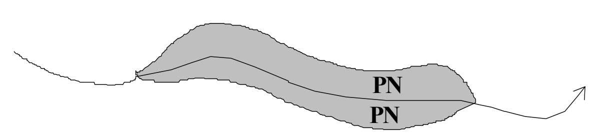
PTYPE	DESCRIPTION INFORMATION	VECTORIZING/DIGITIZING & CODING METHOD
Hydro features coded based on USGS quad representations		
BA	IT or PN (intermittent or perennial) • Initially, the banks are coded with duration of either IT or PN. Those duration codes are used to populate the polygon which those arcs surround. Then, the bank durations are coded as NA.	
CB	PN (perennial)	
DP	IT or PN (intermittent or perennial) • Initially, the banks are coded with a duration of either IT or PN. Those duration codes are used to populate the polygon which those arcs surround. Then, the bank durations are coded as NA.	
DC	PN (perennial)	

Wisconsin DNR 24K Hydrography
DECISION RULES

POLYGONAL DURATION (BY POLY TYPE)
--ALL AUTOMATED--

PTYPE	DESCRIPTION INFORMATION	VECTORIZING/DIGITIZING & CODING METHOD
FH	PN (perennial)	
FE	PN (perennial)	
IW	PN (perennial)	
IA	FX (fluctuating)	
IS,UP	NA (not applicable)	

Wisconsin DNR 24K Hydrography
DECISION RULES

<table>
<tr><th colspan="3">POLYGONAL DURATION (BY POLY TYPE)
--ALL AUTOMATED--</th></tr>
<tr><th>PTYPE</th><th>DESCRIPTION INFORMATION</th><th>VECTORIZING/DIGITIZING & CODING METHOD</th></tr>
<tr><td>LP</td><td>IT or PN (intermittent or perennial)
• Initially, the banks are coded with a duration of either IT or PN. Those duration codes are used to populate the polygon in which those arcs surround. Then, the bank durations are coded as NA.
• Sometimes are depicted on a quad as water features filled with diagonal lines. The duration for these lake/ponds is IT. The editor visually determines these durations.</td><td>
</td></tr>
<tr><td>RF</td><td>PN (perennial)</td><td>
</td></tr>
<tr><td>SD</td><td>PN (perennial)</td><td>
</td></tr>
<tr><td>ST</td><td>PN (perennial)</td><td>
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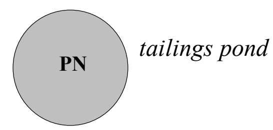
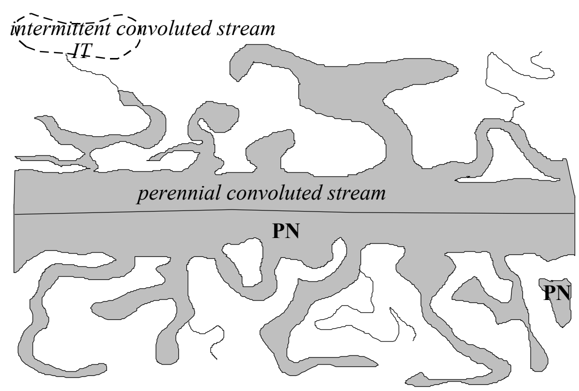
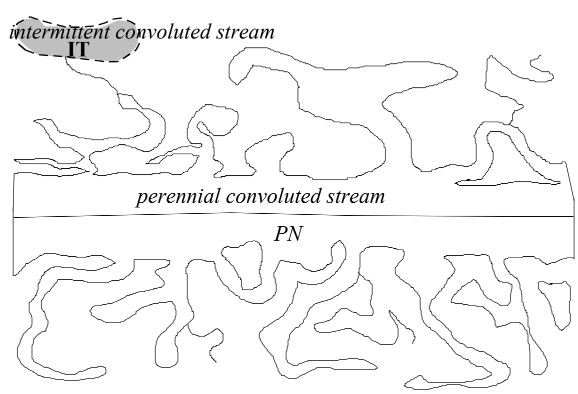
Wisconsin DNR 24K Hydrography
DECISION RULES

POLYGONAL DURATION (BY POLY TYPE)
--ALL AUTOMATED--

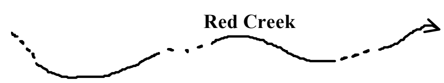
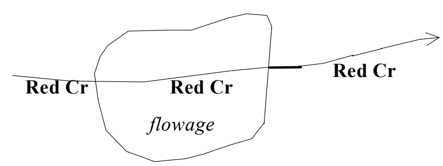
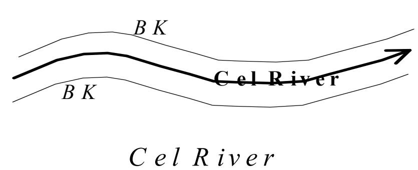
PTYPE	DESCRIPTION INFORMATION	VECTORIZING/DIGITIZING & CODING METHOD
TP	PN (perennial)	
UN	PN (perennial)	
DNR features (hydro features coded based on DNR decision rules)		
ZZ	IT or PN (intermittent or perennial) • Initially, the banks are coded with a duration of either IT or PN. Those duration codes are used to populate the polygon in which those arcs surround. Then, the bank durations are coded as NA.	 

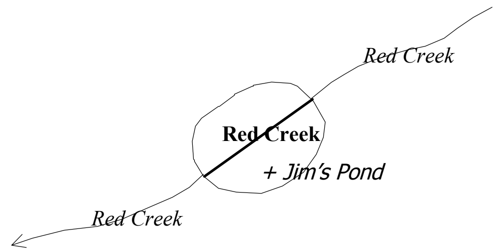
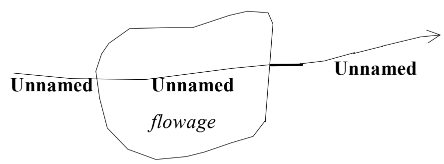
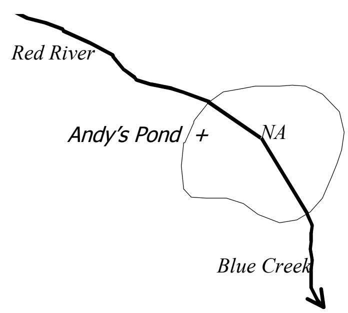
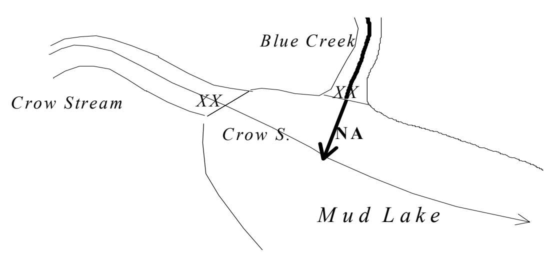
SECTION III
Wisconsin DNR 24K Hydrography
GNIS NAMING DECISION RULES

Wisconsin DNR 24K Hydrography
DECISION RULES

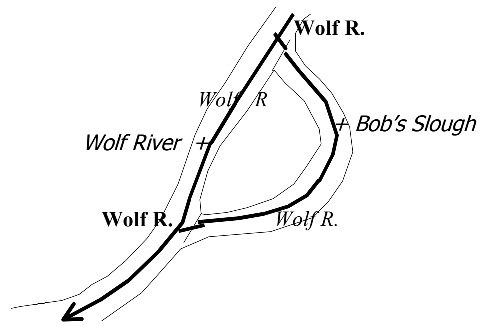
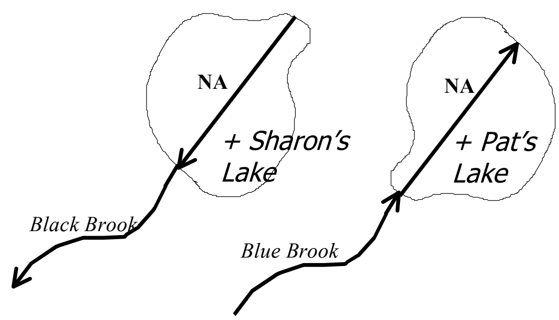
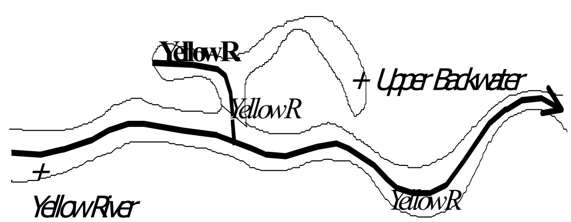
The 24k Hydrography name field is derived from the Geographic Names Information System (GNIS) developed by the United States Geological Survey (USGS). GNIS is the federally recognized name for features within the United States.
Names have been applied to arcs in the AAT, polygons in the PAT, and SHAID regions in the PATSHAID.

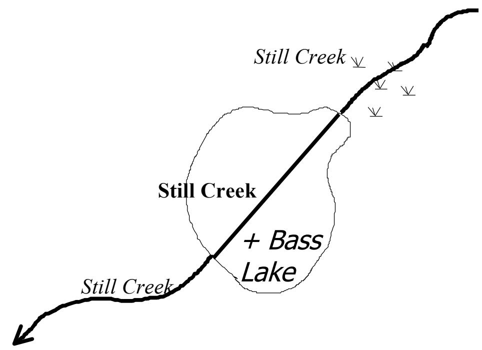
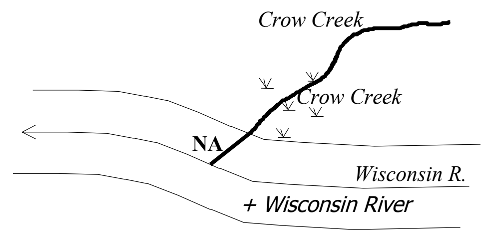
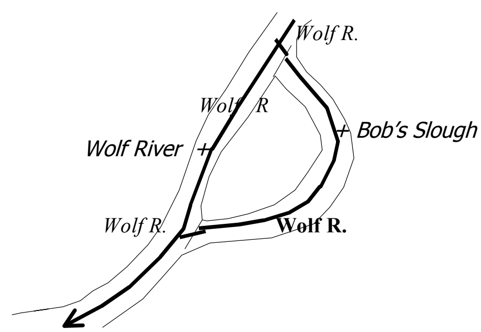
RIVSYSNAME ON LINEAR FEATURES

CODE	DESCRIPTION INFORMATION	DATA CAPTURE & CODING METHOD
ST	single-line stream	GNIS names based on visual determination from USGS Quads.   
CL	stream centerline • In the case of a CL running through a named lake, the CL takes on the GNIS name of the ST, not the LP.	In double-line streams and lake/ponds with same-stream inlet and outlet, or any polygon water feature, the GNIS name is given to the CL, rather than the BK. 

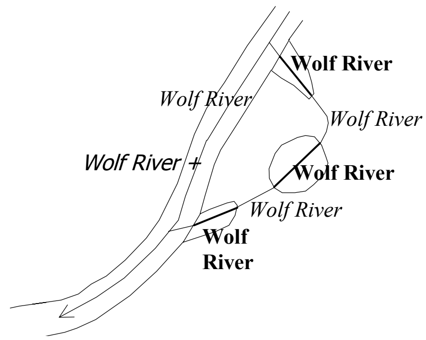
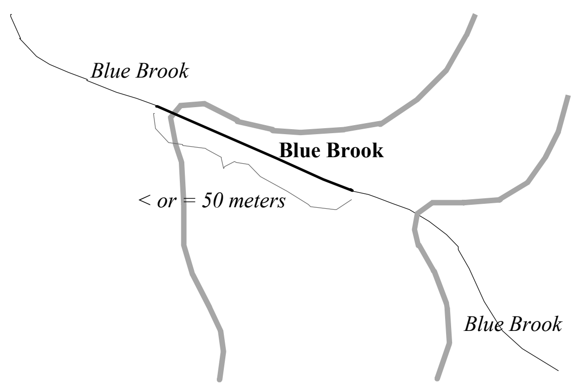
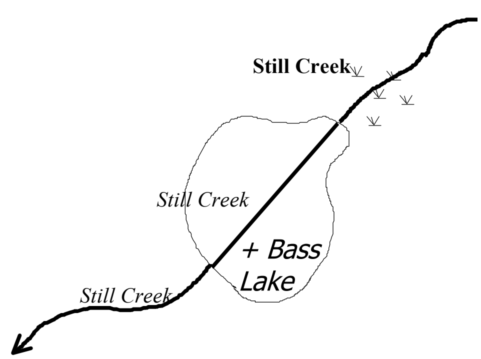
RIVSYSNAME ON LINEAR FEATURES		
CODE	DESCRIPTION INFORMATION	DATA CAPTURE & CODING METHOD
CL cont.	• In the case of a CL running through a lake, the CL takes on the "Unnamed" of the river running through, not the name of the LP. • When one named stream (or unnamed) flows into a lake/pond, and a stream of a different name flows out, the CL receives no GNIS name – the named stream begins or ends at the banks, not within the lake/pond	  
EX.	stream extension • Stream extensions never receive GNIS names, with one exception. Overall, a stream starts or ends and the banks of a lake/pond, not within the polygon.	EX arcs do not receive GNIS names in most cases, unless they extend from a secondary channel . 

RIVSYSNAME ON LINEAR FEATURES

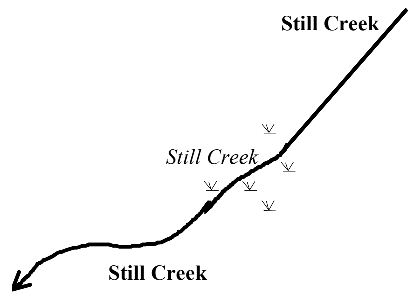
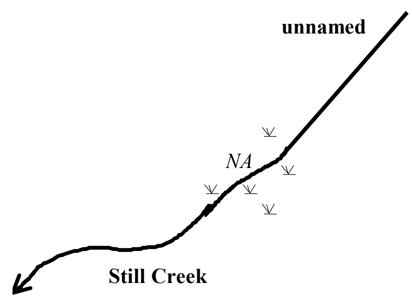
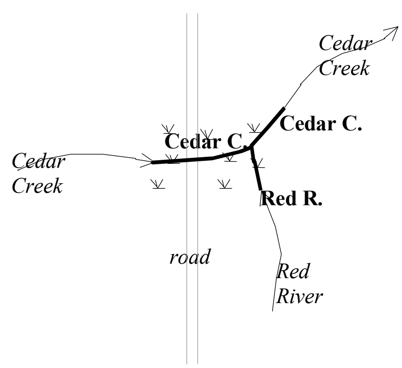
CODE	DESCRIPTION INFORMATION	DATA CAPTURE & CODING METHOD
EX cont.d	• EX arcs from a secondary flow will have the name of the ORIGINAL channel, even if the secondary channel is named. This is the only case in which an EX will receive a GNIS name	
FP	flow potential • Occurs within an open water polygon that has an outlet but not an inlet, or an inlet but no outlet. These receive no GNIS name • Occurs in *named* backwaters only.	Below are examples of several possible occurrences of flow potentials, and the GNIS naming procedures:  

RIVSYSNAME ON LINEAR FEATURES		
CODE	DESCRIPTION INFORMATION	DATA CAPTURE & CODING METHOD
FP cont.	• Occurs where a tributary stream potentially flows through an adjacent wetland and into a lake/pond. If the same-named stream is an outlet of that lake/pond, then the FP receives the name of that stream. If it is unnamed, a different name, or has no outlet, the FP is NA.	
	• FP arcs flowing into a polygon river out of a named wetland gap are NA.	
	• Occurs in a polygonal secondary channel (similar to a centerline, except that the water polygon in which it occurs is coded as a secondary channel). FP receives name of the main channel.	

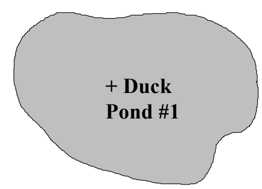
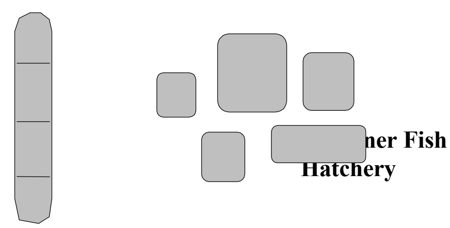
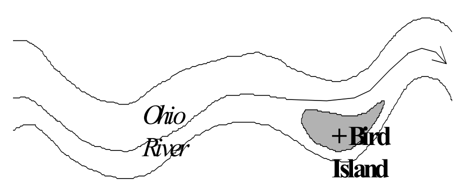
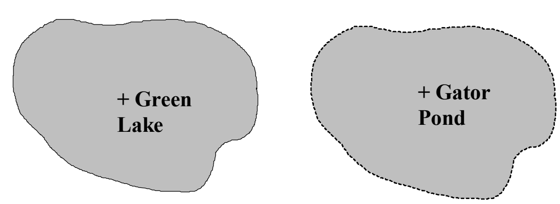
RIVSYSNAME ON LINEAR FEATURES

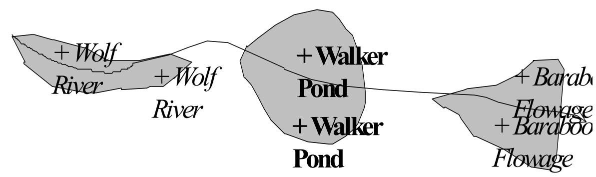
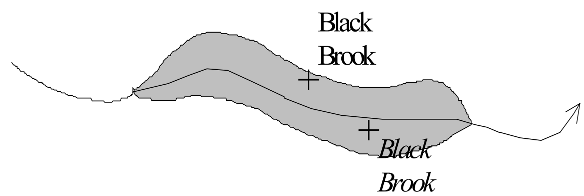
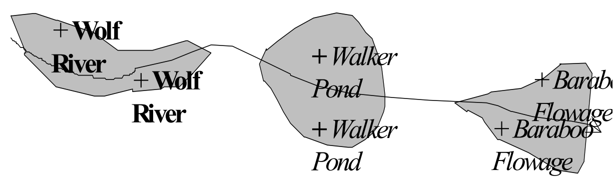
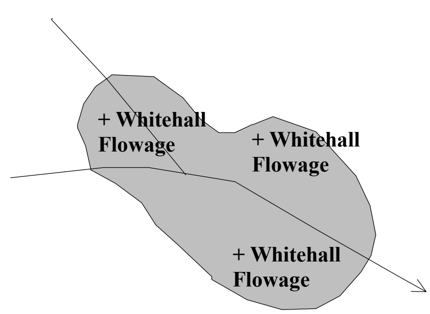
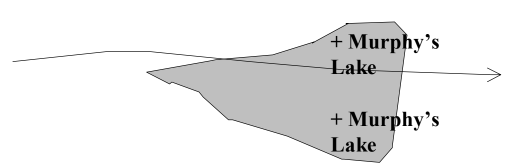
CODE	DESCRIPTION INFORMATION	DATA CAPTURE & CODING METHOD
FP cont.	• Occurs where there is a gap between two or more hydro features, and the contour lines indicate a downhill slope, but no wetlands exist between the features; a flow potential is added as long as the distance between the hydro features is equal to or less than 50 meters.	 
WG	wetland gap connector • Wetland gap takes on the name of the stream flowing through it, when the stream name is the same both upstream and downstream	Below are a series of situations involving WG, and how to name the WG in such cases. 

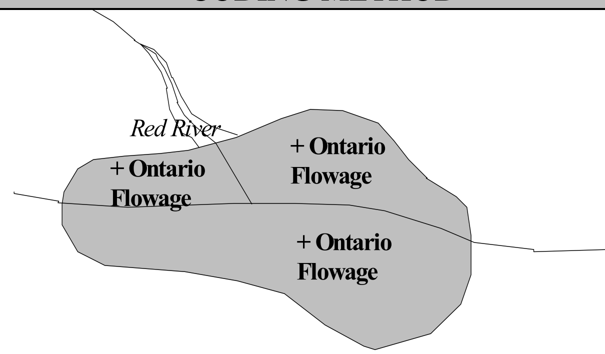
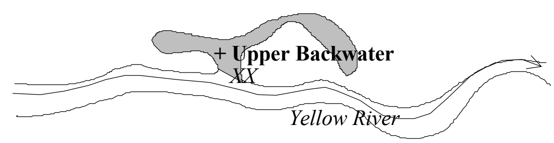
RIVSYSNAME ON LINEAR FEATURES

CODE	DESCRIPTION INFORMATION	DATA CAPTURE & CODING METHOD
WG cont	• If a named stream runs through a WG, that WG receives the same name as the stream.	
	• If the stream upstream of the WG is unnamed, but the downstream stream is named, the WG receives NA.	
	• If multiple wetland gaps meet, each section must be assigned the GNIS name of the most directly associated or connecting stream, as if it were a part of that stream.	
Non-transport arcs	• All non-transport arcs including ‘XX’,’BK’,’OC’,’UN’, and ‘BF’ should be coded *Name = ‘NA’*.	

RIVSYSNAME ON POLYGON FEATURES

CODE	DESCRIPTION INFORMATION	CODING METHOD
DP	duck pond	• If the duck pond is named, it will receive that GNIS name. 
FH	fish hatchery or farm	• If the fish hatchery or farm is named, it will receive that GNIS name. 
IS	island	• If the island is named, it will receive that GNIS name. 
LP	lake or pond	• If the lake or pond is named, it will receive that GNIS name. 

RIVSYSNAME ON POLYGON FEATURES		
CODE	DESCRIPTION INFORMATION	CODING METHOD
LP cont'd.		
ST	double-line stream	• If the stream is named, it will receive that GNIS name.  
RF	reservoir or flowage	• If the reservoir/flowage is named, it will receive that GNIS name.  

RIVSYSNAME ON POLYGON FEATURES		
CODE	DESCRIPTION INFORMATION	CODING METHOD
RF cont'd.		
BA	backwater	• If the backwater is named, it will receive that GNIS name. 

SHAID NAMES AND RIVER SYSTEM NAMES ON SHAIDs

	SHAIDNAME	RIVSYSNAME
1	Yellow River	Yellow River
2	Upper Slough	Yellow River
3	Green Flowage	Yellow River

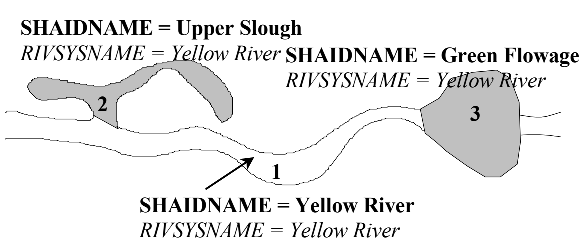


Figure 1: SHAID WBICs

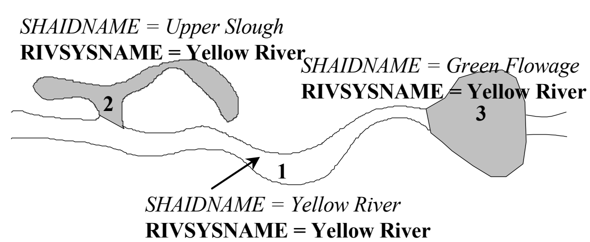
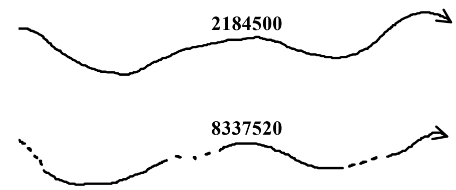
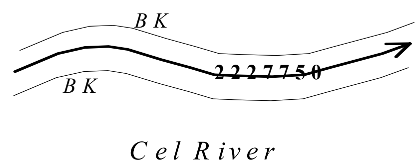
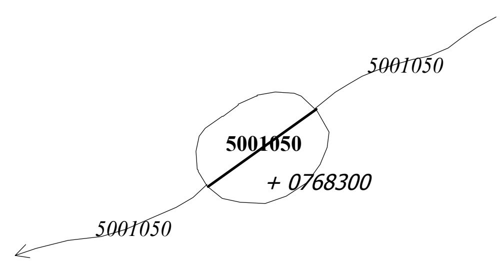


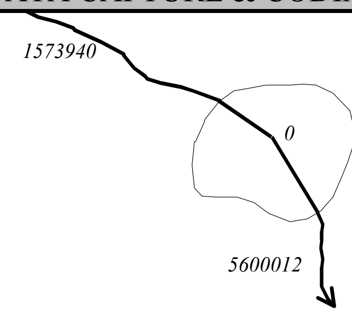
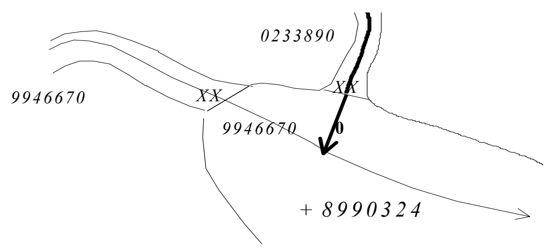
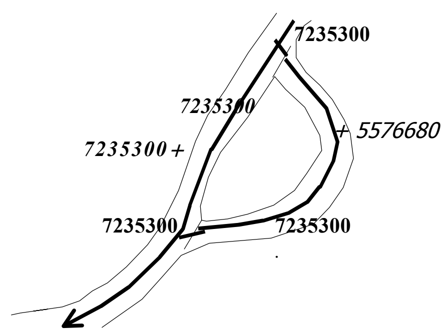
Figure 2: River system WBICs

For more information on SHAIDs, refer to Section V

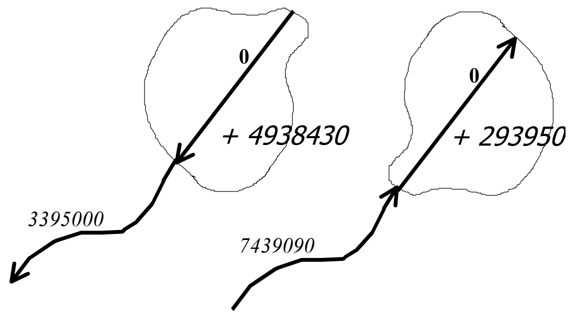
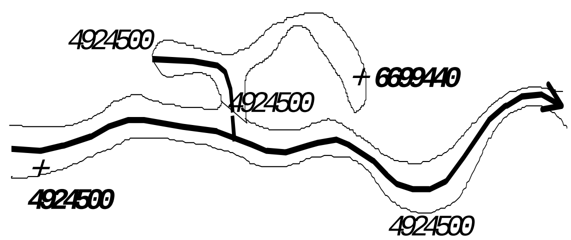
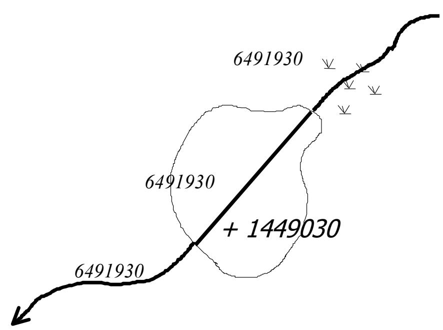
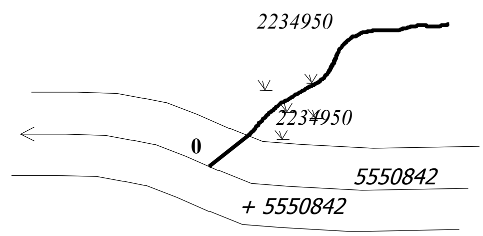
SECTION IV
WDNR 24K Hydrography
Water Body Identification Code (WBIC)
DECISION RULES

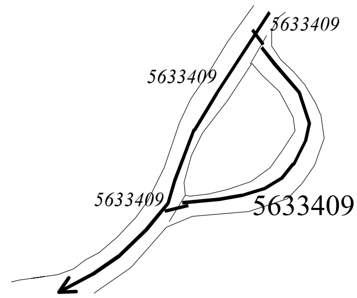
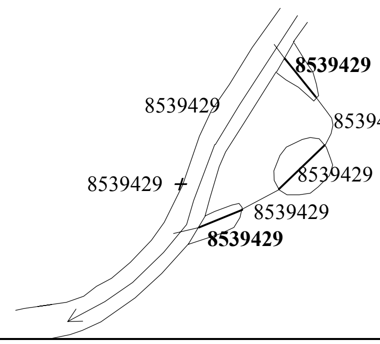
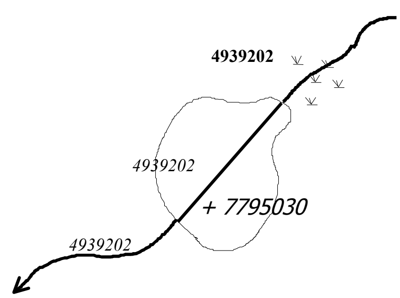
RIVER SYSTEM WBICS ON LINEAR FEATURES		
CODE	DESCRIPTION INFORMATION	DATA CAPTURE & CODING METHOD
ST	single-line stream	WBIC based on ROW data layers. 
CL	stream centerline • In the case of a CL running through a lake, the CL takes on the WBIC of the ST, not the LP. • In the case of a CL running through a lake, the CL takes on the WBIC of the river running through, not the WBIC of the LP.	In double-line streams and lake/ponds with same-stream inlet and outlet, or any polygon water feature, the WBIC is given to the CL, rather than the BK.  

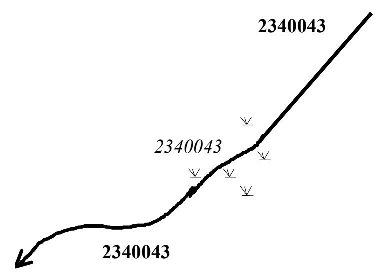
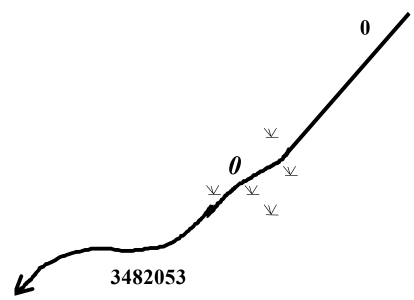
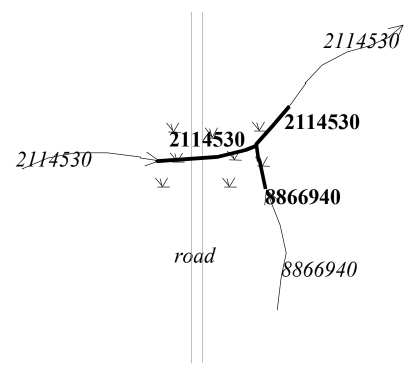
RIVER SYSTEM WBICS ON LINEAR FEATURES

CODE	DESCRIPTION INFORMATION	DATA CAPTURE & CODING METHOD
CL cont.	• when one stream flows into a lake/pond, and a stream with a different WBIC flows out, the CL receives no WBIC – the ID of the stream begins or ends at the banks, not within the lake/pond, and those streams receive the appropriate WBIC	
EX.	stream extension • stream extensions never receive a WBIC, with one exception. Overall, a stream starts or ends and the banks of a lake/pond, not within the polygon. • EX arcs from a secondary flow will have the same WBIC as the ORIGINAL channel, even if the secondary channel poly has its own WBIC. This is the only case in which an EX will receive a WBIC.	EX arcs do not receive a WBIC in most cases, unless they extend from a secondary channel .  

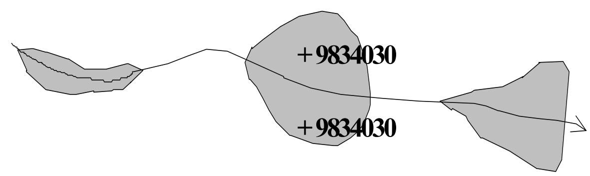
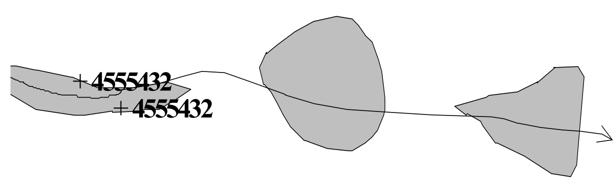
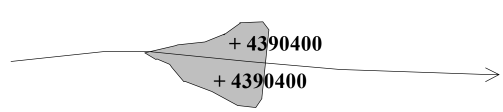
RIVER SYSTEM WBICS ON LINEAR FEATURES

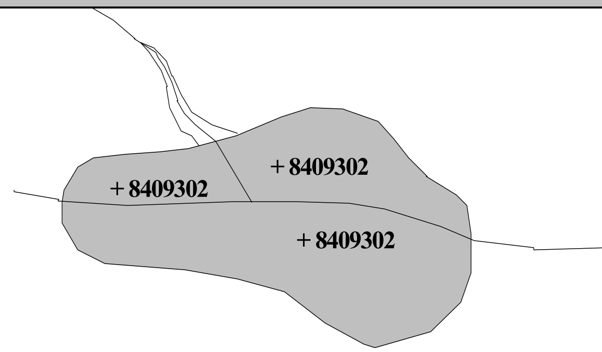
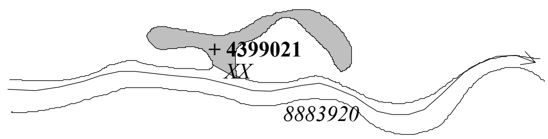
CODE	DESCRIPTION INFORMATION	DATA CAPTURE & CODING METHOD
FP	flow potential	Below are examples of several possible occurrences of flow potentials, and the WBIC assigning procedures:
	• occurs within an open water polygon that has an outlet but not an inlet, or an inlet but no outlet. These receive no WBIC.	
	• occurs in *named* backwaters as well as *unnamed* backwaters	
	• occurs where a tributary stream potentially flows through an adjacent wetland and into a lake/pond. If an inlet and outlet have the same WBIC, then the FP is assigned that WBIC, otherwise the FP gets 0.	
	• FP arcs flowing into a polygon river out of a named wetland gap with WBIC are 0.	

RIVER SYSTEM WBICS ON LINEAR FEATURES		
CODE	DESCRIPTION INFORMATION	DATA CAPTURE & CODING METHOD
FP cont.	• occurs in a polygonal secondary channel (similar to a centerline, except that the water polygon in which it occurs contains arcs coded as a secondary channel). FP receives the same WBIC as the main channel.	 
WG	wetland gap connector • Wetland gap takes on the WBIC of the stream flowing through it, when the stream WBIC is the same both upstream and downstream	Below are a series of situations involving WG, and how to assign a WBIC to the WG in such cases. 

RIVER SYSTEM WBICS ON LINEAR FEATURES		
CODE	DESCRIPTION INFORMATION	DATA CAPTURE & CODING METHOD
WG cont	• If a stream with a WBIC runs through a WG, that WG receives the same WBIC as the stream.	
.	• If the stream upstream of the WG has WBIC = 0, but the downstream stream does have an assigned WBIC, the WG receives WBIC = 0.	
	• If multiple wetland gaps meet, each section must be assigned the WBIC of the most directly associated or connecting stream, as if it were a part of that stream.	
Hydro and DNR features that should not have WBIC values		
BK	Value of –1 for WBIC	AUTOMATED
BF	Value of –1 for WBIC	AUTOMATED
OC	Value of –1 for WBIC	AUTOMATED
UN	Value of –1 for WBIC	AUTOMATED
XX	Value of –1 for WBIC	AUTOMATED
CW	Value of –1 for WBIC	AUTOMATED

POLYGON TYPE

CODE	DESCRIPTION INFORMATION	CODING METHOD
DP	duck pond	• Duck ponds with a WBIC will receive that WBIC.
FH	fish hatchery or farm	• Fish hatcheries or farms with a WBIC will receive that WBIC.
LP .	lake or pond	• Lakes or ponds with a WBIC will be assigned that WBIC. 
	double-line stream	• Rivers with a WBIC will receive that WBIC. 
RF	reservoir or flowage	• Reservior/flowages with a WBIC will receive that WBIC 

<table>
<tr><th colspan="3">POLYGON TYPE</th></tr>
<tr><th>CODE</th><th>DESCRIPTION INFORMATION</th><th>CODING METHOD</th></tr>
<tr><td>RF cont.</td><td></td><td>
</td></tr>
<tr><td>BA</td><td>backwater</td><td>• Backwaters with a WBIC will receive that WBIC.

</td></tr>
<tr><td colspan="3">Hydro and DNR features that should not have WBIC values</td></tr>
<tr><td>UP</td><td>Value of –1 for WBIC</td><td>AUTOMATED</td></tr>
<tr><td>IS</td><td>Value of –1 for WBIC</td><td>AUTOMATED</td></tr>
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SHAID WBICs and RIVERSYSTEM WBICs ON SHAIDS

	SHAIDWBIC	RIVSYSWBIC
1	12345678	12345678
2	1000	12345678
3	5555	12345678

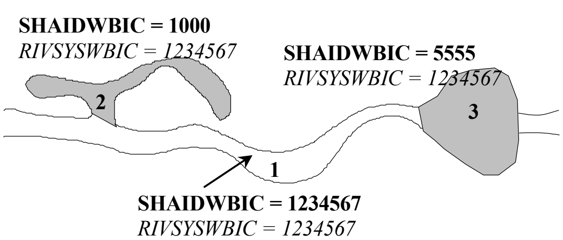


Figure 1: SHAID WBICs

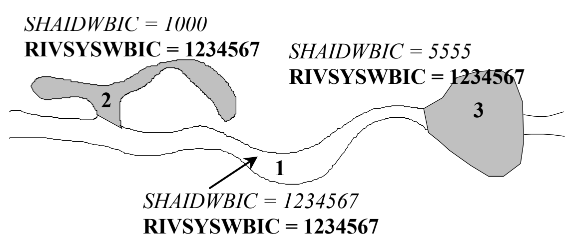


Figure 2: River system WBICs

For more information on SHAIDs, refer to Section V

SECTION V
WDNR 24K Hydrography
SIMPLE HYDRO AREAS (SHAIDs) AND SIMPLE TRANSPORT ELEMENTS (STEMs)

Wisconsin DNR 24K Hydrography
DECISION RULES

The Wisconsin 24K Hydrography linear referencing system and an areal water feature delineation system defines water bodies, double-line streams, backwaters, etc. The linear referencing system is called Simple Transport EleMents (STEMs), represented as an ArcInfo route subclass. The areal water features are called Simple Hydro Area Ids (SHAIDs), represented as an ArcInfo region subclass.

PURPOSE OF THE LINEAR REFERENCING SYSTEM

The LRS was designed as a multi-purpose, multi-user, permanent indexing scheme for defining topological and indirect relationships between connected water features (rivers, flowages, lakes, etc.) and other types of objects (dams, sample sites, waste water outfalls, etc). These requirements mandate the underlying design philosophy, that the reference system be based on lines and polygons and their topology, not any one particular definition of how humans interpret, define, name and/or group these lines and polygons. Instead, the LRS exists so that anyone can define and create their own features, whether they be hydrography features (lakes, rivers, rapids, drainage network) or other types (fish population, scenic shoreline, fishing hole), with the assurance that each feature will retain its topological relationship to each other feature.

The linear referencing system enables users to tie their data to the hydrology layer by way of ArcInfo's point and linear events. Those events are dynamic and remain attached to the Referencing System if the layer was to be projected or the underlying lines and polygons were to change due to updates or corrections in the data.

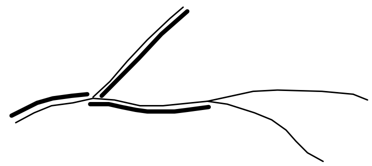
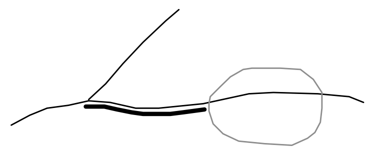
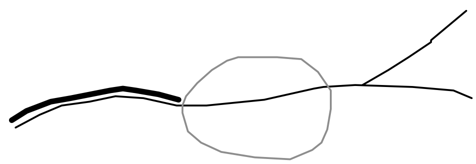
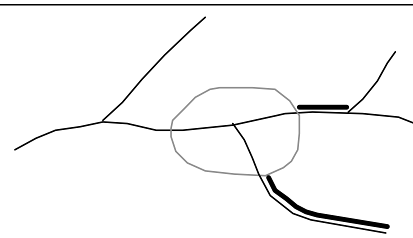
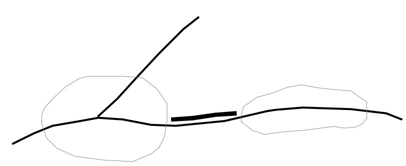
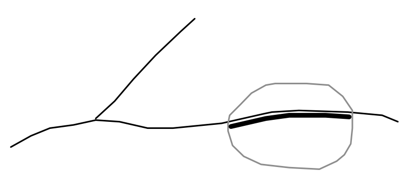
Another reason for developing the linear referencing system was to eventually build a datum from it. At some point in the future we foresee devising point locations throughout the layer, such as bridges and other landmarks that fall along the waterways, confluences, and natural headwaters. The datum would allow for us to map the layer to another source or scale of the data, such as 1:100,000 scale NHD or 1:12,000 scale county hydrography.

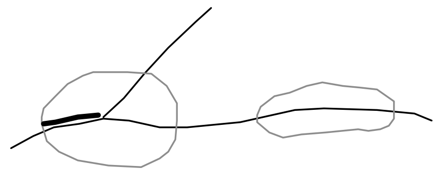
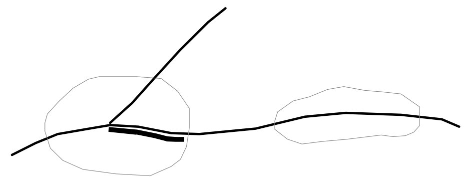
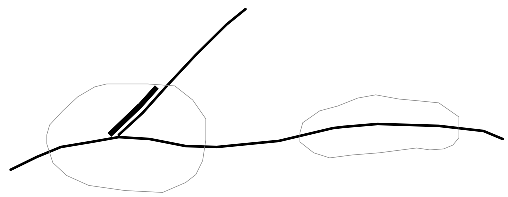
STEM ROUTE DECISION RULES

STEMs exist on all arcs that carry flow; including streams, ditch/canals, cranberry bogs, centerlines, extensions, flow potentials, and wetland gap connectors. The initial scope of this development effort does not include STEM routes on shoreline arcs (banks). (Please refer to the Data Capture and Feature-Coding Decision Rules document for more information regarding the feature codes mentioned above.)

Refer to the following table for STEM delineation rules

Wisconsin DNR 24K Hydrography
DECISION RULES

DELINEATION RULE	EXAMPLE
▪ Terminus to confluence, confluence to confluence, or confluence to terminus	
• Confluence or terminus to areal water feature outlet	 
• Polygonal water feature inlet to confluence or terminus	
• Polygonal water feature inlet to areal water feature outlet	
▪ Areal water feature outlet to areal water feature inlet	

▪ Areal water feature outlet to confluence	
▪ Confluence to areal water feature inlet	
• Extensions (from centerline to areal water feature inlet)	

Wisconsin DNR 24K Hydrography
DECISION RULES

STEM ROUTE DESIGN RATIONALE

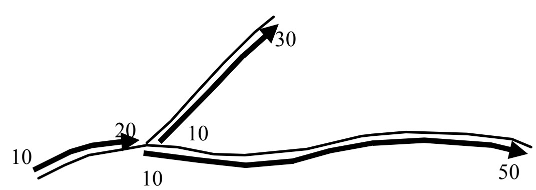
When designing the linear referencing system, we reviewed the following two scenarios: 1) use real-world distance or 2) use something that wouldn't be confused with real-world distance. We chose the latter since the STEM measures will be an index system which should be as stable as possible, and not change whenever a feature's length changes. This means that the location of events are positioned/stored in a relative sense. When someone positions an event using a measure, it should move as little as possible when edits to the hydrography (thus, the routes) are made. If a feature is half way between two confluences or between a confluence and a lake, it should continue to be represented that way. If based on real-world distance (geometry), then the event would move as length of a line/route gets longer (or shorter), such as when using a more accurate (or different) source. This also supports the concept of a Datum, where the same data can be mapped to another source of geometry.

So that measure distance is not confused with length, measures of each STEM begin at 10. Measures are therefore not "ratio" type data.

Our assumption is that a linear event length is calculated as needed, using whatever geometry the index system is currently mapped against (24K, 12K, 100K...). This is only a problem if working in a geographic coordinate system (lat./long.), where measurements are not constant (each feature could be projected on the fly if needed though).

STEM ROUTE DIRECTIONALITY AND MEASURES

STEM route measures are directed upstream.



Wisconsin DNR 24K Hydrography
DECISION RULES

The STEM route measures are initially determined by a classification scheme based on the route length (or length of the aggregated arcs) of 800 meters. The classification starts at 10 and increments by 10 as the length increases into the next 800-meter interval. Refer to the chart below for the classification scheme with UNIT containing the class values.

RECORD	LENGTH	UNIT
1	800	10
2	1600	20
3	2400	30
4	3200	40
5	4000	50
6	4800	60
7	5600	70
8	6400	80
9	7200	90
10	8000	100
11	8800	110
12	9600	120

From the UNIT item, the route measures are created. The arcs below make up **route1**, the total route equaling 20 with a low measure of 10 and a high measure of 30. The measures run opposite of the arc direction and are distributed evenly along the route.

```
      arc1          arc2              arc3
<--------------------<---------<--------------------------------------------
      400m          200m              900m                        = 1500m Total

 ______________  Route1__________________>
10                  20                    30
```

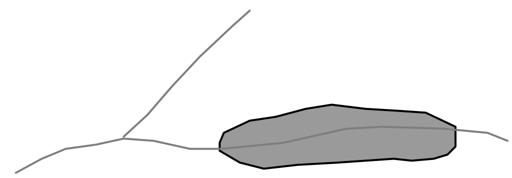
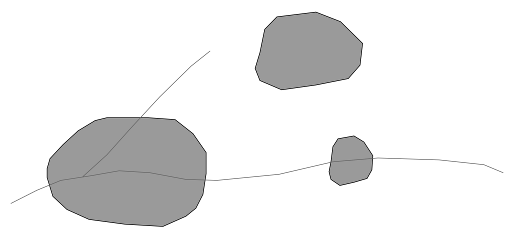
PURPOSE OF SHAID REGIONS

The linear features that were added to connect flow paths through the water bodies and double-line streams (such as centerlines and extensions) split those water bodies and streams into different polygons. SHAID regions were developed to aggregate those polygons so that they represent whole polygonal water features. SHAIDs were also developed as a way for users to reference their data to water bodies and double-line streams if their data pertained to those complete features and are not just point features in or along them.

SHAID REGION DECISION RULES

The SHAID subclass aggregates polygons based upon shore and closure lines. SHAIDs exist on water polygons only. Islands and uplands are not included in the subclass.

Refer to the following table for SHAID delineation rules:

DELINEATION RULE	EXAMPLE
• Double-line stream - beginning at the stream represented by two shorelines and ending at the stream narrowing back to a single-line representation.	
▪ Water bodies (lakes and reservoirs), whether they occur along streams or not.	
• Each adjacent polygonal water body separated by closure lines (In this example you will find 4 SHAIDs, each represented as a different shade of gray).